AGRA UNIVERSITY

TEXT-BOOKS AND SYLLABUSES

PRESCRIBED FOR EXAMINATIONS
TO BE HELD IN
1942 and 1943

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AGRA UNIVERSITY

TEXT-BOOKS AND SYLLABUSES

PRESCRIBED FOR THE EXAMINATIONS MENTIONED BELOW

1942.

(1) M.A. (PREVIOUS):

(*a*) English.
(*b*) Mathematics

(2) B.T.

(3) M.Sc. (PREVIOUS):

All subjects (*except* Physics and Botany)

(4) LL.B. (PREVIOUS).

(5) First & Second M.B., B S.

1943.

(1) B.A

(2) M.A. (PREVIOUS):

(*a*) Arabic
(*b*) Persian
(*c*) Sanskrit
(*d*) Hindi
(*e*) Urdu
(*f*) Philosophy
(*g*) Economics
(*h*) History.
(*i*) Political Science

(3) M.A. (FINAL):

All subjects

(4) B.T.

(5) B.Sc.

(6) M.Sc. (PREVIOUS):

Physics and Botany

(7) M.Sc. (FINAL):

All subjects

(8) LL.B. (FINAL).

(9) LL.M.

(10) B.Com.

(11) B.Sc. (Ag.).

(12) First & Second M.B., B.S.

AGRA UNIVERSITY

TEXT-BOOKS AND SYLLABUSES FOR 1942 AND 1943

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Agra University

TEXT-BOOKS AND SYLLABUSES PRESCRIBED FOR THE EXAMINATIONS OF 1942 AND 1943

B. A. EXAMINATION, 1943.

GENERAL ENGLISH

There will be *two* papers :—

Paper I.—Essay and Unseen.

(1) An essay designed to test the powers of the student to write clearly and correctly on a subject with which he may be expected to be acquainted, and (2) an unseen passage from a modern book, magazine, or newspaper, designed to test the candidate's knowledge and intelligent appreciation of present-day topics and his ability to write a clear *precis*, together with exercises on idiom.

Books recommended—

FOWLER : The King's English. (O. U. P.)

FOWLER : Dictionary of Modern English Usage. (O. U. P.)

Paper II.—General Composition.

Subjects for short essays will be set from the following books, which are not meant for detailed study :—

J. S. HOYLAND : A Brief History of Civilisation. (O. U. P.)

H. WILSON PADLEY : Modern Essays (Rai Saheb M. Gulab Singh, Lahore).

AMARANATHA JHA : Some Autobiographies.

BERNARD SHAW : Arms and the Man.

ENGLISH LITERATURE.

Paper I.—Shakespeare and Drama.

SHAKESPEARE : Cymbeline ; Macbeth.
GOLDSMITH : She Stoops to Conquer.

Paper II.—Poetry

A METHUEN : An Anthology of Modern Verse. (Methuen & Co.) The following Selections only :—

A. E.	... Babylon.
Lawrence Binyon	... For the Fallen.
R. Bridges	.. Passerby.
	The Linnet.
Rupert Brooke	... The Dead.
	The Old Vicarage of Grantchester.
G. K. Chesterton	... The Donkey.
	The House of Christmas.
J. Davidson	.. Romney Marsh.
W. H. Davies	... Leisure.
	The Kingfisher.
	The Moon.
De La Mare	... Listeners,
	All that's Past.
T. S. Eliot	La Figlia che Plange.
J. E. Flecker	.. To a Poet a thousand Years Hence
	. The Dying Patriot.
Drinkwater	.. Midlands
Gibson	.. Flannan Isle.
Edmund Gosse	... The Charcoal Burner.
Gerald Gould	... Wander Thirst.
Thomas Hardy	... When I set out for Lyonesse.
	.. In the time of the Breaking of Nations.
Ralph Hodgson	Stupidity Street.
	... The Bull.
R. Kipling	... If.
	Recessional.
J. Masefield	.. Consecration.
	Cargoes.
Wilfrid Owen	... Anthem for Doomed Youth.
James Stephens	.. Hate.

R. L. Stevenson	... Celestial Surgeon.
	Home no more Home to me.
	Requiem.
Edward Thomas	... Words.
Francis Thompson	.. In no strange Land.
	The Hound of Heaven.
Turner	... Romance.
W. Watson	... Lacrimae Musarum.
W. B. Yeats	.. The Lake Isle of Innisfree.
	When you are old.

A. S. Cairncross : Longer Poems old and New (Macmillan & Co.). The following are prescribed :—
Milton : Lycidas.
Wordsworth : Resolution and Independence.
Keats : The Eve of St. Agnes.
Browning : Andrea Del Sarto.
M. Arnold : Thyrsis.

Paper III.—Prose.

D. C Sharma : Ideals and Realities. (O. U. P.)
Hardy : The Mayor of Casterbridge.
A. J. J. Ratcliffe : Prose of Our Time (Thomas Nelson).

Note 1 —Passages for explanation with reference to the context will not be set from the Novel prescribed under Paper III

Note 2 —Candidates will be expected to show familiarity with the principal metrical forms of English verse The following books are recommended —

Mayor : Modern English Metre (Cambridge University Press).
Egerton Smith : Essay-writing, Rhetoric and Prosody. (O. U. P.)
Holme : English Prosody for Indian Students and Teachers. (Longmans, Green).
L. R. M. Brander : Rhetoric and Prosody. (O. U. P.)

Note 3 —Candidates are expected to show some acquaintance with the main outlines of the history of English Literature during the periods covered by the prescribed texts The following books are recommended :—

Emile Legouis : A Short History of English Literature. (O. U. P.).
Bernard Groom : A History of English Literature (Longmans Green & Co.)
Mair : Modern English Literature (Home University Library).

STOPFORD BROOKE : Primer of English Literature (Macmillan).
G. E. HOLLINGWORTH : A Primer of Literary Criticism (Univ. Tut. Press).
GILKES : Introduction to Modern Poetry (Blackie).
PENDLEBURY : English Lyrical Types (Blackie).

ARABIC.

Books prescribed—
Paper I. Texts—Selections in Arabic Prose and Verse approved by the Allahabad University (Anwar Ahmadi Press, Allahabad).
Omit.—Selection from—
مقامات بديعي and كتاب الشعراء
and *add* مقامات بديعي first 8 maqamat (Mujtabai Press, Delhi).
ادب العرب از مولوي رشيد احمد
Paper II.—Grammar—قصول اكبرى (up to the end of Khasiyat-ı-Abwab) and هدايت النحو
Questions on Grammar will be set in both the papers.
Paper III.—Rapid Reading and Translation from English into Arabic.
Recommended for Rapid Reading—
خلاصة آداب اللغة العربيه (Anwar Ahmadi Press, Allahabad).
NOTE —Arabic words must be written in Arabic character.

PERSIAN.

Paper I.—Prose.
(1) علم الاخلاق مصنفه جسٹس كرامت حسين
From page 255 to the end of page 277.
(در بيان علم احسان)
(در بيان والدين و اولاد)
در اقسام اجتماعات و شرح احوال مدن
(2) نظام الملك طوسى—سياست نامه—" اندر اعمال و پرسيدن پيوسته از احوال وزيران و غلامان " تا " در كارها بر او هيچ چيز پوشيده نه ماند بتوفيق الله تعالى"
(3) ابوالفضل—انشاء—
(1) خطاب حضرت شاهنشاهى بشاه عباس

(۲) منشور حضرت شاهنشاهی به حکیم همام

(4) آئین اکبری—

(۱) آئین بار

(۲) آئین رهنمونی

(5) علاءالدین ابن عطاء ملک جوینی—تاریخ جهانکشا

(۱) ذکر قواعدی که چنگیزخان بعد از خروج نهاد و یاساها که فرمود

(۲) ذکر خروج چنگیزخان و ابتدائی انتقال دولت و مملکت ملوک جهان بدو و احوال آن بر سبیل ایجاز

(6) نورالدین ظهوری ترشیزی

نثر اول از سه نثر

NOTE 1.—Nasrah (نثره) published by Kitabistan, Allahabad, which includes the above selections is recommended.

NOTE 2.—Questions on Grammar will be included in this paper.

Paper II.—Poetry.

(1) قصائد خاقانی :

(۱) دل من پیر تعلیم است و من طفل زباندانش

excluding (i) نه‌ز مرده (ii) نه چون جیپال......... خاقانش (iii) سگ میانی (iv) نعیم الملک............. مستانش (iii) جانش........ زمین دایه......... پستانش (v) جانش........

(۲) صبحدم چون کله بندد آه دود آسائی من

excluding (i) چشمه صلب (ii) چون......... والای من (i) .... اگرچه......... استهزای من (iii) اجزای من

(2) قصائد انوری :

(۱) ای قاعدهٔ تازه ز دست تو کرم را

(۲) جرم خورشید چو از حوت در آید بحمل

(3) قصائد عرفی—

(۱) ای متاع درد در بازار جان انداخته

(۲) اقبال کرم می گزد ارباب همم را

(۳) ای مرتفع زنسبت ذات تو شان علم

(4) قصائد فیضی—

۱—یا ازلی الظهور یا ابدی الخفا

۲—ای نقد عقل و شرع ندانم چه گوهری

(5) قصائد قاآنی

۱—دوشم ندا رسید زدرگاه کبریا

۲—ساقی بده رطل گران زان می که دهقان پرورد

(6) غزلیات پیام مشرق مصنفه علامه اقبال

۱—تسخیر فطرت - صفحه ۹۷ تا ۱۰۱

۲—پیام صفحه ۲۲۵ تا ۲۳۳

(7) غزلیات عراقی

۱—نخستین باده کاندر جام کردند

۲—به شرارهٔ قلندر بزن ار حریف مائی

(8) غزلیات سعدی

۱—سرمست اگر در آئی عالم بهم برآید

۲—برمی رند زمشرق شمع فلک زبانه

(9) غزلیات حافظ

۱—دل میرود ردستم صاحبدلان خدا را

۲—دمے باغم بسر بردن جهان یکسر نمی ارزد

(10) غزلیات عرفی

۱—نوشدارو نشهٔ علت نهد درجان ما

۲—زبان زنکته فروماند و راز من باقیست

(11) غزلیات نظیری

۱—نظر به طائر و صیاد در فضا حجت است

۲—چه خوش ست از دو یکدل سر حرف باز کردن

(12) غزلیات صائب

۱—عشق یکسان نار درویش و تونگر می کشد

۲—به مطلب می رسد جویائے کام آهسته آهسته

(13) غزلیات ابوطالب کلیم

۱—پیری رسید و مستی طبع جوان گذشت

۲ - ازثبات عشق دائم پابه دامن داشتم

(14) غزلیات غالب

۱ هرچه فلک نه خواست است هیچ کس ازفلک نه خواست

۲—بوادئے که دران خضر را عصاخفت ست

(15) مثنوی سکندر نامه نظامی

۱—حمد

۲—مناجات

۳—نعت

۴—پیروزی یافتن اسکندر بر دارا و کشتہ شدن دارا

NOTE —(1) Questions on Rhetoric will be included in this paper,

(2) A general sketch of the History of Literature with reference to the authors prescribed in the text is particularly expected

For the History of Literature, "An Outline History of Persian Literature, by A. H. Faridi" (Ram Prasad and Bros., Agra) is suggested.

Paper III.—Rapid Reading and Translation.

Muntakhabat-Farsi Jadid, by F. Gilani (Gaya Prasad and Sons, Agra) ;

Or

Adabiyyat-i-Ajam, Part III, by A. H. Faridi (Sri Ram Mehra, Agra).

NOTE —The question-paper to contain questions on both the books

Students who offer Persian are required to have such knowledge of the Etymology of the Arabic language as will enable them to explain all Arabic words and phrases which may occur in the text-books and in the book recommended for Rapid Reading in Persian.

NOTE —Persian words must be written in Persian character

SANSKRIT.

Paper I.—Poetry and Drama.

(*i*) Kalidasa : Abhijnana Sakuntalam.

(*ii*) Magha : Sisupalvadha, Cantos I and II.

Paper II.—Prose, Rapid Reading and *either* Rhetoric *or* Elements of Hindu Culture.

(*i*) Bana : Kadambari : Kathamukhaprakaranam upto "श्रूयतां यदि कौतूहलम्"

(*ii*) Bhasa : Pratimanatakam.

Mahabharata condensed by Dr. Raghavan (Natesan & Co, Madras), from Udyoga Parva to Santi Parva.

Students should be taught to study these books by themselves with the help of a Sanskrit-English Dictionary.

(*iii*) *Either*—

Elementary knowledge of Alankaras from Kavya Dipika, only Chapter VIII (अष्टम शिखा, excluding अष्टम शिखालोक)

Or

Elements of Hindu Culture :

(1) The Family.—The Sanskaras and Ashramas, food, clothes and ornaments, house and furniture.

(2) Community.—The Varnas and castes.

(3) Society.—Economic Life—means of livelihood.
Property.—Possession and ownership.
Agriculture, Industry, Trade, Commerce, Coinage.
Origin of Writing.

(4) Political Organisation. Sources of Revenue Spiritual and Temporal Power.
Kingdoms and Republics. Machinery of Government, Royal Offices, Assemblies.
Administration of Justice and Punishments.

Books recommended—

JOLLY : Hindu Law and Custom.

MUKERJI (RADHAKUMUD) : Hindu Civilization.

Paper III.—Composition, Translation and History of Literature.

History of Sanskrit Literature, dealing with the Epics, the Kavyas, Lyric Poetry, Drama, Fairy Tales and Fables.

Books recommended—

KEITH : Classical Sanskrit Literature (Heritage of India Series).

Sita Rama Joshi : Sanskrit Sahitya ka Sankshipta Itihasa (Benares).

MACDONELL : History of Sanskrit Literature, Chapters X—XIV and XVI

Grammar.—Books recommended—

(*i*) KALE or KEILHORN : Higher Sanskrit Grammar.

(*ii*) APTE : A Guide to Sanskrit Composition.

(1) General questions on Grammar will be set in Papers I and II and not more than 10 per cent marks in each paper shall be allotted to them.

(2) Explanation in Sanskrit or in *Tika* form should be confined to Paper I and marks, not more than 15 per cent of that paper, may be allotted to it.

NOTE Sanskrit must be written in Devanagari character

MODERN INDIAN LANGUAGES.

Hindi.

Paper I.—Prose and Drama Texts.

JAI SHANKER PRASAD : CHANDRA GUPTA.

RAM CHANDRA SHUKLA : Tribeni (Revised edition).

KRISHNANAND PANT : Gadya Sangraha (Gaya Prasad & Sons, Agra).

PREM CHAND : Ghaban.

Books recommended—

SHYAM SUNDAR DAS : Goswami Tulsidas.

RAMA KANT TRIPATHI : Hindi Gadya Mimansa.

MAHAVIR PRASAD DWIVEDI : Rasagya Ranjan.

Hindi ke Samajik Upanyas.

Hindi ki Gadya Shaili ka Vikas.

Paper II.—Poetry Texts.

KESHAVADAS : Ram Chandrika (N. P. edition), up to the end of Sundarkand.

SHAMBHU DAYAL SAKSENA : Samkshipta Jayasi.

SHRIDHAR SHARMA PANT : Tulsi Manjari, Revised edition. (Madan Mohan and Co., Chandausi).

BHUDEVA SHARMA : Kadambini.

SURDAS : Sur Muktavali. (Revised edition).

Books recommended—

MAITHILI SARAN GUPTA : Yashodhara.

RAM KRISHNA SHUKLA : Sukavi Samiksha.

S. S DAS : Hindi Bhasha aur Sahitya (portion on Literature).

KRISHNA SHANKAR SHUKLA : Hamare Sahitya ki Rup Rekha.

RAM KRISHNA SHUKLA : Kavyajigyasa.

The following syllabus is prescribed in Rhetoric :—

(*a*) अलंकार—

(*i*) शब्दालंकार—वक्रोक्ति, अनुप्रास, यमक, श्लेष ।

(*ii*) अर्थालंकार—उपमा (पूर्णोपमा, लुप्तोपमा, मालोपमा), प्रतीप, रूपक, उल्लेख, स्मरण, भ्रांति, संदेह, अपन्हुति, उत्प्रेक्षा (वस्तु, हेतु, फल) अतिशयोक्ति, दीपक, निदर्शना, व्यतिरेक, सहोक्ति, परिकरांकुर, अप्रस्तुतप्रशंसा (अन्योक्ति), विभावना, असंगति, यथा-

संख्य वा क्रम, परिसंख्या, अर्थान्तरन्यास, दृष्टांत, मुद्रा, तद्‌गुण, अतद्‌गुण, मीलित और उन्मीलित ।

(*b*) रस—रस और भाव—

रस निष्पत्ति (विभाव, अनुभाव, संचारी) ।

(*c*) दोष—श्रुतिकटु, च्युतसंस्कृति, अश्लीलत्व, अप्रतीतत्व, ग्राम्यत्व, क्लिष्टत्व, न्यूनपदत्व, अधिकपदत्व, अक्रमत्व, पुनरुक्ति और दुष्क्रमत्व ।

Paper III.—Translation and Composition.

Translation from English into Hindi and Composition.

Books recommended—

H. N. TANDON: Rajat Kana.

GULAB RAI: Prabandha Prabhakar. (Hindi Bhawan, Lahore).

SHIVA PRASAD AGRAWAL: Prabandha Piyush.

URDU.

Paper I.—Prose.

(1) داک پروانہ مصنفہ پریم چند

(Gaya Prasad & Sons, Agra.) (2) چمنستان نثر—

by Dr. Abdul Haq (3) مقدمات عبدالحق حصہ دوم

(4) نیرنگ خیال حصہ اول مصنفہ مولانا آزاد دہلوی

Paper II.—Poetry.

(*a*) Marsia.

(1) جب قطع کی مسافت شب آفتاب نے (میر انیس)—مطبوعہ اگرہ اخبار پریس آگرہ

(*b*) قصائد و غزلیات

(2) گلچین سخن (انتخاب قصاید و غزلیات) شائع کردہ گیا پرشاد اینڈ سنز—آگرہ

Omitting—

(*i*) ہوا جب کفر ثابت ہے یہ تمغائے مسلمانی

(*ii*) واہ وا کیا معتدل ہے باغ عالم کی ہوا

(*c*) Modern Poetry

(3) خضر راہ } از ڈاکٹر سر اقبال
(4) طلوع اسلام }

Books to be consulted—

(1) تاریخ ادب اردو مصنفہ رام بابو سکسینہ
ترجمہ مرزا محمد عسکری صاحب مطبوعہ منشی
نولکشور پریس لکھنؤ

(2) تاریخ و تنقید ادبیات اردو مصنفہ حامد حسن قادری
(L. N. Agarwal, Bookseller, Agra).

(3) مقدمہ و بصرہ روح بطیر مرتبہ مخمور اکبرآبادی—

(4) اردو کے اسالیب بیان مصنفہ ڈاکٹر سید محی الدین قادری

(5) عطر عروض مصنفہ نواب احسان علی آف بانده - مطبوعہ
نظامی پریس لکھنؤ

NOTE,—(*a*) The evolution of Ghazal in its various branches (mystic, philosophic, didactic, lyric etc) should be studied.

(*b*) Questions on the general History of Literature and criticism of the authors studied will be set in both Papers I and II

(*c*) Candidates will be expected to know the peculiarities of the dialect (Lucknow or Delhi) in which each work is written, and the distinctive feature and merits of each writer

Paper III.—Translation and Composition.

(*a*) Translation from English into Urdu.

(*b*) Essay in Urdu.

NOTE —The following book is recommended to suggest the type of English passages for translation into Urdu —

Selected English Pieces for Urdu Translation (Gaya Prasad and Sons, Agra).

MARATHI

There shall be three papers of three hours duration. The first paper will be set on the prescribed prose texts and and criticism. The second paper on the poetry texts and criticism The third paper on (1) Translation from English into Marathi, and (2) Marathi composition and general reading. Candidates are expected to select in third paper only one out of three forms (*a*), (*b*) or (*c*).

The ability of the candidates to read and write मोडी (Modi) will be tested by means of a question or questions set in the third paper.

Candidates are expected to posses an adequate knowledge of General Marathi Grammar (derivation and

Samasas in particular) with a general knowledge of the historical development of words and case terminations and a fair knowledge of the history of Marathi language in general and the authors prescribed in papers I and II in particular.

N B —In all papers rules regarding spelling of Marathi words recommended by the Maharashtra Sahitya Parishad (महाराष्ट्र साहित्य परिषद्, पुणें) Poona, may be observed

The following books are recommended for a knowledge of the general history of language and literature.

General reference.

1. वि० ल० भावे—महाराष्ट्र सारस्वत (नवीन आवृत्ति)
2. ल० रा० पांगारकर—मराठी वाङ्मयाचा इतिहास खंड १-२-३ (के० भि० ढवले मुंबई २)
3. वि० सी० सरवटे—मराठी साहित्य समालोचन (मराठी साहित्य सभा, इंदूर)
4. ह० गं० कवचाले—मध्य भारतीय मराठी वाङ्मय (म० साहित्य सभा, इंदूर)
5. कृ० पां० कुलकर्णी—मराठी भाषा—उद्गम आणि विकास
6. वि० पां० नेने—अर्वाचीन मराठी साहित्य (प. चुरे पुराणिक मंडली, मुंबई)

Paper I—Prose texts and criticism.

1. रामचन्द्रपंत अमात्य—आज्ञापत्र (सिंहल ब्रदर्स, तोपखाना, इंदूर)
2. रा० ग० गडकरी—संपूर्ण बालकराम (क० भि० ढवले, गिर गाँव मुंबई २)
3. अप्पा किलीस्कर—सं० सौभद्र (परचुरे पुराणिक मंडली, मुंबई २)
4. कृष्णाबाई—अनिरुद्ध प्रवाह—(कं० भि० ढवले, गिरगाँव, मुंबई २)
5. रामतनय—खरा उद्धार (हिंद माता पुस्तक मन्दिर, पुणें २)
6. बा० गं० टिलक—निबंधकार टिलक (ह्यूनस स्टोअर्स पुणें ४)

About ten per cent of the total number of marks will be reserved for Philological and Grammatical questions.

Books recommended for reference :—

1. प्र० बा० वापट—गोडबोले—कादंबरी तंत्र आणि विकास (म० बा० वापट व्हिक्टोरिया कालेज, ग्वालियर)
2. वि विध ज्ञान विस्तार स्मारक ग्रन्थ—नाट्य वाङ्मय आणि अर्वाचीन वाङ्मय

Paper II—Poetry Criticism and Alankars.

1. ज्ञानेश्वर, नामदेव, जनाबाई यांचे निवडक अभंग (सदाशिव शुकडिपो तोपखाना, इंदूर)

2. मुक्तेश्वर—सभापर्व—अध्याय १ ते ८ (निर्णयसागर प्रेस, मुंबई)
3. भा० रा० तांबे-तांबे यांच्या कविता (मस्ते आवृत्ति) सिंदिया बुकडिपो ग्वालियर)
4. महिपती—भक्तविजय—ज्ञानेश्वर, नामदेव, जनाबाई यांचे अध्याय
5. वा० ना० देशपांडे—आराधना (नवभारत ग्रंथमाला, कांग्रेस नगर, नागपुर)
6. प्र० वा० बापट—मराठी अख्यानक कविता (सिंदिया बुकडिपो ग्वालियर)
7. रामदास—श्रीसमर्थांची लघुकाव्ये (पृष्ठ १४१-२७१) (सत्कार्योत्तेजक सभा, धुळें)

About ten per cent of the total number of marks will be reserved for questions on rhetorics and poetics. The following syllabus is prescribed. काव्यलक्षण (प्राचीन आणी अर्वाचीन) काव्यप्रकार, ध्वनि, रस, अलंकार, दोष, वृत्तेंव छंद (प्राचीन व आधुनिक)

For detailed study of ज्ञानेश्वर the following are specially recommended—

(*a*) Chapters I, II, VI and VII from the History of Indian Philosophy, Vol. VII 'Mysticism in Maharashtra' by Dr. S. K. Belvalker and Prof. R. D. Ranade.

(*b*) Chapters IV, VI, VII, IX, X from श्रीज्ञानदेव by वा० म० हंस (and published by के० भि० ढवले—गिरगांव, मुम्बई २)

Books recommended for reference :—

1. भा० भ्यं० पटवर्धन—पद्यप्रकाश (कर्नाटक प्रेस, मुंबई)

2. सुलभ साहित्यादर्श (Messrs. Shri Ram Mehra and Co., Maithan, Agra) but the portions on syllabus prescribed above are to be studied as text.

Paper III—Translation, Composition and Unseens and general reading (Special forms of Literature).

Translation from English into Marathi, Marathi Unseens and Composition for which three forms of literature are recommended. The candidates are expected to select *only one of them* and their answers are expected to be in the form of a complete essay (narrative, descriptive, reflective, character study or criticism).

Marks will be approximately divided as follows :—

(*i*)	Translation from English into Marathi ...	12
(*ii*)	Marathi Unseens and Composition ...	30
(*iii*)	Modi reading and writing ...	8
		50

Forms of Literature :

(*a*) *Poetry from 1890 onwards* :—

1. केशव सुतांची कविता
2. वाग्यवैजयंती
3. रविकिरण मंडळाची कविता
4. महाराष्ट्रशारदा भाग १ (श्रीसमर्थसदन प्रकाशन). (के० भि० ढवळे, मुंबई)
5. यं० खं० कुलकर्णी—मानसनिष्यन्द

(*b*) *Drama from 1890 onwards* :—

1. श्री० कृ० कोल्हटकर—मूकनायक वीरतनय, सहचारिणी
2. कृ० म० खाडीलकर—कांचन गडची मोहना, मानापमान, कीचकवध,
3. रा० ग० गडकरी—पुण्यप्रभाव, प्रेमसंन्यास, राजसंन्यास
4. भा० वि० वरेरकर—कुंजविहारी, सत्तेचे गुलाम, कोरडी करामत
5. प्र० के० अत्रे—साष्टांग नमस्कार, घराबाहेर, लग्नांची बेडी
6. द० म० बोरगांवकर—शांतिस्वरूप
7. य० खं० कुलकर्णी—साध्वीरत्न

(c) *Fiction from 1890 and onwards* :—

1. ह० ना० आपटे—मधली स्थिती, उष:काल, गडआला पण सिंह गेला० पी० च.णा.चपणाचा कळस
2. वा० म० जोशी—रागिणी सुशिलेचा देव, इंदु काळे सरला भोळे
3. ना० सी० फडके—कुलाब्याची दांडी, उद्धार, प्रवासी
4. वि० स० खांडेकर—उल्का, हृदयाची हांक, सुखाचा शोध
5. भा० वि० वरेरकर—धांवता धोटा, विधवाकुमारी, पेटतें पाणी
6. वि० सी० गुर्जर—पौर्णिमेचा चन्द्र
7. चिं० वि० वैद्य—ठगाची जबानी

Candidates are expected to answer in the form of a complete essay (narrative, descriptive, reflective character study or critical type).

PHILOSOPHY.

There will be *two* papers :—
Either—

Paper I—(*a*) Psychology and Metaphysics—

(*i*) *General Psychology* :

I. The Problem, Data and Methods of Psychology. The Branches of Psychology.

II. Empirical Facts about the relation of Body and Mind. The Structure and Functions of the Nervous System, in outline.

III. The general characteristics of Mental Life. The different Levels of Consciousness. The inseparable factors of Mental Life : Cognition, Feeling, and Conation ; their relation to one another.

IV. Intelligence, its nature : determining factors : Heredity and Environment : Methods of testing Intelligence.

V. Learning, animal and human. Learning by Trial and Error. Learning by Imitation. Learning by Insight. Formation and breaking of Habit.

VI. Attention : its nature and relation to Consciousness Kinds of Attention. Conditions of Attention.

VII. Sensation. The distinguishing characters of Sensations. Different kinds of Sensations Sensation and Stimulus. Weber-Fechner Law.

VIII. Perception and Sensation. The nature and characteristics of Perception. Factors in the Perception of Space. Illusions and their causes.

IX. Memory. Learning : Retention : Recall : Recognition Percept and Memory-image.

X. Imagination. Kinds of Imagination. Hallucinations and Delusions. Day Dreams. Dreams. Freud's theory of Dreams.

XI. Thinking : Factors of advantage in Association. Reasoning.

XII Feeling. Feeling and Emotion. Emotion and Instinct. Emotion and its expression. The James-Lange theory of Emotion. Moods. Sentiments and Complexes.

XIII. Conation. Automatic Acts : Reflex Acts, Conditioned Reflexes, Random Acts, Instinctive Acts. Ideo-Motor Actions, Voluntary Actions.

XIV. Personality. Types of Personality. Integration and Disintegration of Personality. Diseases of Personality. Psycho-analysis. The Unconscious or Subconscious Mind.

(*ii*) *Metaphysics* :

G. T. W. PATRICK : Introduction to Philosophy (revised

edition, Allen and Unwin); Chapters I, II, IV, VI, X, XIII, XVI, XVII, XVIII, XX, XXII, XXIII and XXVI.

N. B —Candidates are expected to attempt three questions from each part in Paper I (*a*)

Or

Paper I.—(*b*) Psychology : General and Experimental—

(*i*) General Psychology. [***Syllabus the same as under (a) (i)***].

(*ii*) Elementary Experimental Work in Psychology.

NOTE,—There will be a practical examination for those offering Experimental Psychology

Books recommended for the syllabus in General Psychology—

R. S. WOODWORTH : Psychology (Tenth edition).

ANGELL : Psychology (revised edition), especially for Parts I, II and III of the Syllabus.

The scope of the experimental work is indicated by Seashore's Elementary Experiments in Psychology (Henry Holt & Co.)

Or

Paper I.—(*c*) Psychology: General and Social Psychology—

(*i*) General Psychology, [***Syllabus the same as under (a) (i)***].

(*ii*) Social Psychology :

GINSBERG : The Psychology of Society (Methuen, London).

Paper II.—Ethics.

SYLLABUS.

1. The Problem, Scope and Methods of Ethics. Relation of Ethics to Psychology, Sociology, Politics, Economics, Metaphysics and Religion

2. Ethical concepts and their division into ultimate and non ultimate. Analysis of Good, Right, Virtue, Duty, Merit and Responsibility. Subjective and Objective Morality : their obligatoriness.

Ethical value—Intrinsic and Extrinsic Commensurability of Values.

Judgements—Appreciative and Descriptive: Self-evident and Provable. Nature of Moral Judgments. Objectivity of Moral Judgments.

3. Psychological analysis and Ethical significance of Desire, Will, Motive, Intention, Conduct, Character and Habit.

4. Principal theories of the nature of the Moral Standard—

(*a*) The Standard as Law; The Law of Nature; The Law of God; The Law of the Tribe; Moral Sense; The Law of Conscience; Intuitionism; The Law of Reason.

(*b*) The Standard as Pleasure: Hedonism—Psychological, Ethical and Evolutionary.

(*c*) The Standard as Perfection: Ethics of Self-realization.

5. Concrete Moral Life. Relation of Ethical Theory to Practice. Rights, Duties and Virtues. Justice, Benevolence, *Ahimsa*. Theories of Punishment. Social and Ethical Institutions. Functions of the State. Moral Progress.

6. Development of Ethical Thought. The doctrine of Cardinal Virtues, Ethics of Naturalism. General treatment of the Ethical doctrines of Spencer, Mill, Kant, Nietzsche, Gandhi.

7. Special Problems.

(1) Metaphysical Implications of Ethics: Freedom, Theistic Interpretation of the World. Immortality.

(2) International Morality.

Books recommended for the Syllabus—

MUIRHEAD: Ethics.

MACKENZIE: Manual of Ethics.

J. SETH: Ethical Principles.

ECONOMICS.

There will be *two* papers. About half the total marks shall be allotted in each paper to general principles of Economics and the remainder to facts of Indian economic life. The following syllabus is prescribed:—

PAPER I.

1. *Introductory.*—Subject matter. Economics as a Science and an Art. Relation to other sciences. Its divisions.

2. *Methods.*—Deductive and Inductive. Nature of economic law.

3. *Definitions.*—*e. g.*, utility, wealth, capital, income, production, consumption, value, money.

4. *Production.*—The factors of production—land, labour, capital and organization (management and enterprise). Natural resources and human knowledge to use them. Natural resources—agricultural, mineral, geographical, power.

5. *Land.*—Factors affecting its productivity. Physical features of India. The Indian monsoons. Division of soils.

6. *Products of Indian Land.*—Agricultural products and their distribution. Minerals and their distribution. Forest products. Possibilities of water-power.

7. *Rural Economics.*—Different land tenures. Zamindari and ryotwari systems. Permanent and temporary settlements: merits and defects of each. Consolidation of agricultural holdings. Factors affecting agricultural improvement in India.

8. *Labour.*—Factors determining its efficiency, Malthus' theory of population, positive and preventive checks. Health and strength of the population; its character and training.

Indian Labour.—Occupation, efficiency, capacity, and scope for training. Density of population. Its causes, Migration. Health and vital statistics. Standard of living. Effect of social customs.

9. *Capital.*—Harmonies and conflicts of labour and capital. Conditions affecting the growth of capital. Fixed and circulating capital. Advantages of machinery.

Indian Capital.—Agricultural capital. Roads, Railways: development, management, economic effects. Water transport. Irrigation: varieties, Government works, water rates.

10. *Organization.*—Distinction from labour. Function. Division of labour: meaning, advantages, disadvantages, limited by the extent of the market. Localization of industries: causes, advantages, disadvantages. Territorial division of labour.

The Law of productivity.—Combination of the factors of production. The law of substitution. The laws of diminishing, increasing, and constant returns with curves. Their operation in agricultural and manufacturing industries. Factors affecting the operation of the Law of diminishing returns.

The scale of production.—Large and small scale. Advantages of each.

Industrial organization.—Joint stock enterprise. Various kinds of shares; debentures; risk involved in each. Merits and defects of joint stock enterprise.

11 *Co-operation.*—Co-operation in production, distribution or consumption, and credit. Productive co-operation. Distributive co-operation. The Co-operative Wholesale Society of the United Kingdom. Co-operative credit: purpose, rural and urban. Raiffeisen system and land banks, Schulze Delitzsch system.

Co-operative credit in India.—Primary societies; area of operations, liability, shares and dividend security, productive and unproductive loans, concessions from Government funds, test of efficiency and financial stability; their benefits: economic, educational, social, etc. Land banks, their need, Urban co-operative societies. Central Societies, Provincial Credit Banks. Statistics of number of societies, members, working capital.

12. *Distribution.*—Problem due to group production. National dividend. Distribution as link between production and consumption. Equalization of marginal productivity. Mobility of the factors of production.

13. *Rent.*—Definition. Marginal cost and rent surplus. Rent in intensive and extensive cultivation. Causes of rent. The law of rent. Factors affecting rent. Rent does not determine but is determined by price.

14. *Wages.*—Marginal productivity theory. Factors determining the rate of wages. Influence of custom. Nominal and real wages. Time and piece or efficiency wages. Wages Fund Theory. Peculiarities of labour as an agent of production. Trade Unions. Brief survey of trade unions in India.

15. *Interest.*—Meaning, justification. Gross and net interest. Rate of interest and productivity of capital. Risk and interest. Effect of mobility of capital on the

rate of interest. Rate of interest and saving. Indian rate of interest ; cause of variation in different areas ; seasonal variation of the discount rate

16 *Profit*—Meaning. Its relation to the rate of wages. Gross and net profit. Risk, remuneration of enterprise, surplus. How each is determined ? Surplus profit and rent. Turn over. Profit and price. Profits in India.

PAPER II.

1. *Exchange*—Origin. Sale and Purchase. Barter ; difficulties ; gain of exchange.

Market.—Definition. Place and time markets. Causes of extention of markets. Time markets : daily, short, long, and secular.

Balancing and demand and supply.—General theory of desire and aversion ; their measurement. Laws of variation: law of utility, law of disutility, law of efficiency. Conditions of exchange : two-sided monopoly, one-sided monopoly or competition, two-sided competition. Theory of value : utility and cost of production. Limits of variation in exchange value. Operation of the force of demand and supply upon exchange value in the daily, short-period, long-period, and secular markets.

Speculation.— Dealings in future. Relations between present and future prices The stock exchange ; investors, jobbers, bulls and bears. Effect of speculation in steadying prices.

Joint demand and supply. Alternative demand and supply. Derived demand. Condition in which check to the supply of one factor in joint demand may raise its price.

2. *Monopoly.*—Meaning. Kinds of monopoly, kartel, trust, vertical combinations. Classifications of monopolies, Causes of industrial combinations. Law of monopoly revenue. Effects on monopoly revenue of elastic and inelastic demand and of the operation of the law of productivity. Class price and use price. Advantages and disadvantages of monopoly. Control of monopolies.

3. *International trade.*—Difference from internal trade : mobility of the factors of production. Law of comparative cost. Advantages and disadvantages of international trade. International value: limits of variation fixed by the difference in comparative costs. Favourable and adverse balance of trade. Equation of indebtedness, mean-

ing, factors affecting it. India's balance of trade : important items of foreign trade, important countries of export and import.

4. *Free trade and protection.*—Meaning of each. Arguments for and against. Means of encouraging Indian industries. Conditions in which protection may be desirable in India. Fair trades. Countervailing duties. Reciprocity. Retaliation. Imperial preference.

5. *Money.*—Definition, characteristics, functions Special suitability of the precious metals ; legal tender, full and limited. Free coinage. Standards of money ; the quantity theory of money. Other factors affecting the level of prices. Appreciation and depreciation. Inflation and deflation, their effects. Index numbers : objects, construction, weighting, defects. Gresham's law and its limitations. Bimetallism : meaning, operation in limited and wide areas. · Law of compensatory action. Paper money : convertible and inconvertible, covered and fiduciary. Indian Paper currency.

6. *Credit.*– Postponement of payment and risk. Bills of exchange in retail and wholesale trade. Discounting and endorsing a bill Credit and capital. Effect of credit on production

Banking.—Functions, Discounts. Book credit. Bank's balance-sheet. Money market. The Clearing House System : purpose, working, advantages.

7. *Systems of Banking.*—The United Kingdom : the Bank of England. Banking and currency theories. The Bank Charter Act of 1844 (as amended in 1928). India : The Imperial Bank, the joint-stock banks, the exchange banks, the Government Treasury system, indigenous banking, co-operative banks, savings banks. Defects in Indian credit organization. Central Reserve Bank.

8. *Foreign Exchange.*—Meaning. Foreign bills of exchange, drawer, acceptor, currency in which payable. Their supply and demand, consequent effect on the exchange rate. Specie points. Factors affecting the demand and supply of bills : trade, stock exchange, and banking. Par of exchange : mint par. Correctives to the exchange rate.

9. *The Indian Currency.*—Short history up to 1893. Measures taken in 1893 and 1899. The Gold Exchange

Standard. Machinery of maintaining the rate. Effects of a rise or fall in the price of silver. Measures taken in 1919 and 1927. Effects—temporary and permanent, of a rise and fall of the rate of exchange upon trade and production. Summary of the measures recommended by the Currency Commission of 1926 (brief outline of proposals regarding the rate, the gold bullion standard, and the Central Reserve Bank).

10. *Consumption.*—Distinction from destruction, saving, and hoarding. Kinds of human wants, their limitations and variety. Law of consumption, classification of consumption into necessaries, comforts, and luxuries, and of necessaries into bare efficiency, and conventional necessaries. Efficiency as the basis of classification. Variation of classification according to time, place, individual, and the unit of consumption.

11. *Measurement of Wants.*—Law of diminishing utility or satiable wants. Factors modifying the operation of the law. Marginal and total utility. Law of equimarginal utility. Law of demand. Elasticity of demand. Factors affecting the elasticity of demand. Consumer's surplus ; definition, measurement. Engel's Law of consumption. Methods of spending and prices in relation to satisfaction. Relation of spending and savings. Reaction of consumption on production. Economic waste.

12. *Public Finance.*—Difference between public and private expenditure. Public expenditure and functions of Government Theory of maximum social advantage. Brief summary of sources of State income and of public debt.

13. *Taxation.*—Definition and characteristics of a tax. The tax system. Canons of taxation. Direct and indirect taxation. Incidence of taxation. Taxes and monopolies. Shifting of a tax.

14. *Indian Finance.*—Peculiarities of Indian Finance ; Home charges, capital expenditure, exchange operations, agricultural seasons. Brief summary of expenditure and public debt. Main sources of Imperial and Provincial revenue. Outline of the present system of land revenue, income-tax, customs, salt, and railway revenue.

15. Causes of variation in national wealth and progress.

Books recommended—

MARSHALL : Elements of Economics of Industry.
THOMAS : Elements of Economics.
P. BASU : Principles of Economics.
KRISHNA KUMAR SHARMA : The Indian Money Market.
N. L BHATNAGAR : Elements of Economics
F. BENHAM : Economics (Pitman)
The Indian Year Book.

HISTORY.

There will be *two* papers :—

Paper I.—General History of Modern Europe from 1648 to 1914.

ACTON : Lectures on Modern History.
HAYES : A Social and Cultural History of Europe, Vol. I
HAZEN : Modern European History.
European History Atlas (Denoyer Greppert Co., Chicago).

NOTE.—Questions on English History should not be compulsory

Paper II.—A Period of Indian History.

Either

(*a*) Ancient India up to 1200 A. D.

V. A SMITH : Early History of India, edited by Edwardes.
R. C. MAJUMDAR : Ancient Indian History and Culture.
Greater India Society's Bulletins on India and China, India and Central Asia, and Java and Sumatra (Part 1).
R. D. BANERJI : Pre-Historic, Ancient and Hindu India.

Or

(*b*) Mediæval India, 1000-1707 A. D.

FOSTER : Early Travels in India.
ISHWARI PRASAD : Muslim Rule in India (Book II only).
ISHWARI PRASAD : History of Mediæval India.
AIYANGAR : South India and her Mohammedan Invaders.

J. N. SARKAR : Mughal Administration.
EDWARDES AND GARRETT : Mughal Rule in India (Part II only).
DUTT AND SARKAR : A Text-book of Modern Indian History, Vol. I, Parts 1 to 3.

Or

(c) Rise and Establishment of British Dominion in India, 1740-1919 (including Administration).
LYALL : Rise and Expansion of British Dominion in India.
RAMSAY MUIR : Making of British India.
Sindhia (Rulers of India Series).
Ranjit Singh (Rulers of India Series).
DODWELL : Indian History after 1857 A. D.
Simon Commission Report, Vol. I.
DUTTA AND SARKAR : Text-book of Modern Indian History, Vol. II, Parts 1 and 2.

POLITICAL SCIENCE.

There will be *two* papers —
Paper I—Political Theory.
Nature and scope of Political Science.
Theories of the origin and nature of the State.
The classification of States.
Functions of the State.
Political conceptions—Liberty, Equality, Rights, Citizenship, Public opinion, Sovereignty, Nationality, Imperialism and Internationalism.
Modern Political Theories—Idealism, The Scientific school, The Psychological school, Individualism, Socialism, Communism, Pluralism, Fascism.
Development of the State.
Forms of Government.
The structure of the State.
Books recommended—
JOAD : Modern Political Theory.
RAM AND ASIRVATHAM : Political Theories and Modern Government, Vol. I.
BARKER : Political Thought from Spencer to the Present Day.

COLE : Guide to Modern Politics.
GARNER : Political Science and Government.

Paper II.—*Either*—

(A) Constitutions :—

(*a*) Detailed study of the Indian Constitution and (*b*) Outline study of the Constitutions of England, U. S. A., France and Switzerland.

Books recommended—

MUNRO : Governments of Europe.
RAM AND SHARMA : Political Theories and Modern Governments. Vols. II and III.
G. N. JOSHI : New Constitution of India.
K. T. SHAH : Provincial Autonomy (Revised edn.)
K. T. SHAH : Federal Structure.

Or

(B) A study of the Constitutions of Great Britain, India, and the Dominion, including a study of the constitutional organisation of the British Empire.

Books recommended—

SYDNEY LOW : Governance of England.
RAMSAY MUIR : How Britain is Governed.
The Government of India Act of 1935.
ZIMMERN : The Third British Empire.
KEITH : Governments of the British Empire.
K. T. SHAH : Federal Structure.

GEOGRAPHY.

There shall be *two papers* each carrying 75 marks.

Paper I.—

(a) Physical Basis of Geography :

A broad knowledge of the physical geography of the world, including knowledge of elementary geology, sufficient for the correct appreciation of geographical phenomena.

The earth as a planet ; its movements and relation to the sun ; the consequent distribution and seasonal variation of insulation over the Earth's surface.

The atmosphere : distribution and periodic variation of the pressures and temperature of the air, of air move-

ments and wind systems, of humidity and precipitation ; climatic types and regions.

The oceans : the form of sea and ocean beds ; temperature and salinity of oceans and seas, waves and tidal movements and their effects, origin and effects of ocean circulation.

The lands : general classification of the materials of the earth's crust ; sedimentary, igneous, and metamorphic rocks, crustal movements ; the normal cycle of erosion and its principal interruptions ; process of denudation and deposition and chief effects of glaciation ; development of river systems.

(b) Human Geography :

Contents and aims of Human Geography ; the scope and interpretation of racial, social, economic, and political aspects of Human Geography ; its place among social sciences.

Types of physical environment considered from the standpoint of human life.

Primitive use of physical environment ; characteristics and organisation of societies typical of grasslands, deserts, forests and other types of natural environment ; changes in the character of these as a result of modern economic development and commerce.

Development of Geographical knowledge.

Major natural regions of the world with examples from Asia and India.

(c) Practical Work :

Representation and interpretation by maps and diagrams of (*a*) Land forms, (*b*) their development, (*c*) their relation to structure, (*d*) their influence on Human Geography. Candidates will be expected to be familiar with Survey Maps.

Elementary surveying, including the use of the prismatic compass, plane table, clinometer and chain

Principles of the following map projections, their effects and suitability for particular purposes :—

Conical with one or two standard parallels, Bonne, Polyconic, International, Sinusoidal, Mollweide, Mercator, Zenithal equidistant, Zenithal equiarea.

Construction and interpretation of weather and climate maps. The cartographic and diagrammatic representation of geographical data.

NOTE —There will be no practical examination, but questions referring to practical work will be included in the theory paper.

Books recommended—

Paper I.—

1. Physical Basis of Geography :—
   WOOLRIDGE and MORGAN : Physical Basis of Geography.
   WILMORE : Groundwork of Modern Geography.
   TARR AND MARTIN : College Physiography.
2. Human Geography :—
   VIDEL DE LA BLANCHE : Human Geography.
   HUNTINGDON : Principles of Human Geography.

Paper II.—

(*a*) Europe or Asia.
(*b*) India in detail.

Books recommended—

BLANCHARD AND VISHER : Europe.
LYDE : Asia.
M. SHACKLETON : Europe
DUDLEY STAMP : Asia.
L. LYDE : Europe.

MATHEMATICS.

(*Same* as for B. Sc.)

MILITARY SCIENCE.

(*Same* as for B. Sc.)

M. A EXAMINATION.

ENGLISH LITERATURE

PREVIOUS.

(For the Examination of 1942.)

There will be *four* papers.

Paper I.—English Poetry from 1798 to the present day

Prescribed Texts : (*a*) *For Detailed study*—

WORDSWORTH : Selected Poems (edited by Matthew Arnold, Golden Treasury Series).
KEATS : Odes.
SHELLEY : Adonais.
BYRON : Childe Harold, Cantos III and IV.
SWINBURNE : Atalanta in Calydon.
The Golden Treasury of Modern Lyrics (edited by Binyon), Book II.

(*b*) *For General study*—

TENNYSON : In Memoriam.
BROWNING : Selections by Young.
MORRIS : The Defence of Guenevere and other Poems including Life and Death of Jason (World's Classics Edition).

Paper II —The Drama, with special reference to Shakespeare.

Prescribed Texts (*a*) *For Detailed study*—

SHAKESPEARE : Twelfth Night, Richard II, Winter's Tale, Hamlet.
BEN JONSON : The Silent Woman.
SHERIDAN : Rivals.
BERNARD SHAW : Candida.
GALSWORTHY : Strife.

NOTE —Candidates will be expected to show first-hand acquaintance with all the principal plays of Shakespeare

(*b*) *For General study*—

DRYDEN : All for Love.
MILTON : Samson Agonistes.
DRINKWATER : Abraham Lincoln.
COATS : Galsworthy (Duckworth).

Paper III.—English Poetry from 1580 to 1800

Prescribed Texts :

MILTON : Paradise Lost, Books III and IV

POPE : Rape of the Lock.

N. SMITH : The Oxford Book of Eighteenth Century Verse (Poems of Thompson, Collins, Goldsmith and Blake).

(*b*) *For General study*—

W. T. YOUNG : An Anthology of the Poetry of the Age of Shakespeare (Cambridge University Press).

Paper IV—English Prose from 1580 to 1800.

Prescribed Texts :(*a*) *For Detailed study*—

SIDNEY : Apologie for Poetrie.

BACON : Essays I to X

MILTON : Areopagitica.

DRYDEN : Preface to the Fables.

ADDISON : Essays (edited by Fowler, English Literature Series, Macmillan).

JOHNSON : Life of Milton.

Books recommended for General reading—

Paper I.

PIERCE : Currents and Eddies in the English Romantic Generation (O. U P)

SAINTSBURY : Nineteenth Century Literature (Macmillan).

HUGH WALKER : The Literature of the Victorian Era (Cambridge University Press).

Paper II.

A. NICOLL : Theory of Drama (Harrap).

BRADLEY : Shakespearean Tragedy.

SIDNEY LEE : Life of Shakespeare.

HERFORD : Outlines of Recent Shakspearean Investigation.

DOWDEN : Shakespeare : His Mind and Art.

SCHELLING : The English Drama (Channels of Literature).

CHARLES WILLIAMS : A Short Life of Shakespeare with Sources. (O. U. P.)

Paper III.

COURTHOPE : History of English Poetry (Macmillan).

O. ELTON : The Augustan Ages (Blackwood).

H. J. C. GRIERSON : The First Half of the Seventeenth Century (Blackwood).
C. E. VAUGHAN : The Romantic Revolt.
PHELPS : Beginnings of the Romantic Movement.

Paper IV.

A. H. BULLEN : Elizabethans (Chapman and Hall).
SIDNEY LEE : Great Englishmen of the Sixteenth Century.
CHURCH : Bacon (Macmillan).
GOSSE : Thomas Browne (Macmillan).
GOSSE : Eighteenth Century Literature.
CRAIK : English Prose Selections, Vol. IV.

FINAL.

(For the Examination of 1943).

There will be *four* papers and a *viva voce* test.

Paper I.—History of English Literature from 1350 to 1914, including questions on the History and Principles of Criticism. Candidates will be expected to show first-hand knowledge of the principal works of the representative authors.

Paper II.—Early Poetry from Chaucer to Spenser, including an elementary study of Middle English Grammar.

Prescribed Texts : *(a) For Detailed study—*

CHAUCER : Prologue to the Canterbury Tales.
Nonne Priestes' Tale.
LANGLAND : Prologue to Piers Plowman.
SPENSER : The Faerie Queene, Book II.

(b) For General study—

SKEAT : Specimens of English Literature from 1394—1579.

Paper III.—English Prose from 1800 to the present day.

Prescribed Texts : (a) For Detailed study—

WALTER PATER : Appreciations (Macmillan).
A. S. CAIRNCROSS : Modern Essays in Criticism (Macmillan).
HAZLITT : Selected Essays edited by Sampson (Cambridge Unit. Press).

(b) For General study—

The Novel, with special reference to—
SCOTT ; Old Mortality.

THACKERAY : Vanity Fair.
MEREDITH : The Ordeal of Richard Feveral.
HARDY : Tess of the D'Urbervilles.
A BENNETT : Old Wives' Tale.

Paper IV.—An Essay.

Books recommended for General reading—

Paper I.

SAINTSBURY : History of English Literature.
LEGOUIS AND CAZAMIAN : History of English Literature, two vols. (Dent).
GOSSE : Modern English Literature.
HAROLD WILLIAMS : Modern English Literature.

CORRECTION SLIP

M. A. (Final) English for 1943.

Paper III.

'age 30.

Substitute Selections from William Hazlitt, (King's Treasuries Series), (Macmillan)

For HAZLITT : Selected Essays edited by Sampson (Camb. University Press)

... ... Previous and Final Examinations of 1943)

NOTE.—Arabic words must be written in Arabic character

There shall be *eight* papers, four for the Previous and four for the Final. Paper VII (Translation) must be offered in the Previous, and Paper VIII (Essay) in the Final. Out of the other six, a candidate may select any three for the Previous and the other three for the Final.

Paper I.—Classical Prose—

(*i*) مقامات حريري ten maqamat

(*ii*) انوارالمنتخبه

(*iii*) کلیله و دمنه

Paper II.—Classical Poetry—

(*i*) باب‌الحماسه — دیوان‌الحماسه and المرائی

(*ii*) المعلقات‌السبعه

Paper III.—Literary criticism.

(*i*) کتاب المعارف by ابن قتیبه

(*ii*) الفخری

Paper IV.—History of Arabic Literature: Haurt or Nicholson.

Papers V and VI.—Any two of the following:—

(*a*) Mysticism—Selection from رساله قشیریه and احیاءالعلوم

(*b*) Commentary on the Quran—Selections from کشاف or بیضاوی or جمع‌الجوامع طبری

(*c*) Text Hadith with the Allied Lughat *either* صحیح مسلم with the help of مجمع‌البحار or استبصار with the help of مجمع البحرین

(*d*) Logic and Metaphysics (قاضی مبارک صدر احمدالله)

(*e*) Comparative Philology of Semitic Languages: O'Leary's Comparative Grammar of Semitic Languages.

(*f*) History of Islam (one specific period from آئین اکبری or طبری)

Paper VII.—Translation from English into Arabic and *vice versa*.

Paper VIII.—Essay on a literary subject.

NOTE.—Critical questions shall be set in Papers I and II. A sound knowledge of Syntax, Prosody, and Rhetoric shall be expected.

PERSIAN.

(*For the Previous and Final Examinations of 1943.*)

NOTE.—Persian words must be written in Persian Character

There shall be eight papers, four for the Previous and

four for the Final. Paper VIII (Essay) must be offered in the Final. Out of the other seven, a candidate may offer any four in the Previous and the other three in the Final.

Paper I.—Classical Prose :

(1) نثر دوم—ظهوری

(2) شبنم شاداب—تفرشی

Paper II.—Classical Poetry :

(1) انتخاب کلیات قاآنی published by Anwarul Matabe, Lucknow

(2) انتخاب قصائد عرفی

The following *qasidas* are prescribed :

(۱) اے متاع درد در بازار جاں انداختہ

(۲) اقبال کرم می گزد ار باب ہمم را

(۳) اے برزدہ دامن بلا را

(۴) سپیدہ دم چو زدم آستیں بشمع شعور

(۵) جہان بگشتم و دردا بہیچ شہر و دیار

(۶) صبحدم چوں در دمد دل صور شیون زاے من

(۷) دیکہ لشکر غم میکشد بخون خواری

(۸) دل من باغبان عشق و حیرانی گلستانش

(۹) چہرہ پرداز جہان رخت کشد چوں بحمل

(۱۰) ز آسمان و زمیں مژدہ ناگہاں آمد

(۱۱) صباح عید کہ در تکیہ گاہ ناز و نعیم

(۱۲) ایں بارگاہ کیست کہ گویند بے ہراس

(۱۳) ہر سوختہ جانے کہ بکشمیر در آید

(۱۴) کجا بحسن بود باتو ہم عناں نرگس

(۱۵) نو بہار آمد کہ افشاند بحسن یار گل

Paper III.—Sufistic Poetry :

(1) مثنوی مولانا جلال‌الدین رومی (Selections published by Anwarul Matabe, Lucknow).

(2) ردیف "ت"—دیوان حافظ

(3) Mantiqut-tair by Attar, from جمع شدن مرغان جہان واغاز داستان منطق‌الطیر upto end of حکایت در گفتار پاک دینی

(4) قصیدہ فریدالدین عطار beginning with می‌نگارم
قصیدہ عطار
(شائع کردہ حاجی معین‌الدین انجینیر حیدر آباد دکن-)

Paper IV.—Biographies

Biographical and Critical Study of Saadi.

Books recommended—

(1) Hayat-e-Saadi by Hali.
(2) Shi'r ul A'jam by Shibli.
(3) E. G. Browne's (1) Literary History of Persia, Vol. II;
(2) History of Persian Literature under Tartar Dominion, Vol. III.
(4) Article on Saadi in the Encyclopædia of Islam.
(5) Tazkara Daulat Shah.

Paper V.—History of Persian Literature:

Section I: Pre-Ghaznavid from Ninth century A. D., Ghazanavid, Seljuq, Mongol and Early Timurid Periods.

Or

Section II: Later Timurid, Safavid, Mughal and Qachar Periods.

Books suggested—

E. G. Browne: History of Persian Literature, four volumes.

M. A. Ghani: History of Persian Language at the Moghul Court, three volumes.

NOTE.—The question-paper to contain questions on both the Sections

Paper VI.—Modern Prose and Poetry.

(1) سوانح عمری حاجی بابائے اصفهانی— (Bombay edition).

translated by اسد الله خاں :—

جلد اول :—از فصل اول در بیان احوال تولد حاجی بابا و تربیتش
تا ختم فصل دهم در مشورت کردن حاجی بابا خودش الخ-

(2) دوام یوسف و زلیخا by Mirza Suleman Hasan, edited by Kh. Latif Ahmad (Urdu Book Agency, Amraoti).

(3) انتخاب کلیات قا آنی "ردیف الف و ب" (published by Sheikh Mubarak Ali, Lahore).

(4) ادبیات ایران نو (Qaumi Kutub Khana, Lahore).

Paper VII.—One of the following subjects selected by the Head of the Department in the beginning of the session :

(*a*) Mysticism :

۱—کیمیائے سعادت غزالی—: (۱) عنوان اول در شناختن خویشتن
(۲) عنوان دوم درشناختن حق سبحانه و تعالیٰ
(۳) عنوان سوم در معرفت دنیا
(۴) عنوان چهارم در معرفت آخرت

۲—نفحات الانس جامی :—
از تمهید فی القول فی الولایة والولی تاشروع ذکر ابو هاشم الصوفی

(3) کشف المحجوب from الکلام فی تفصیل الانبیاء علی الاولیاء to the end of ابراهیم فی الکلام در سکوت

(*b*) Politics and Civics :

(1) تدبیر منزل—اخلاق ناصری

(2) سیاست مدن—اخلاق جلالی

(*c*) Historical Literature :

(1) جلد چهارم—تاریخ طبری from the beginning up to ذکر حجة الوداع

(4) احوال امیر تیمور from Chapter XIII تاریخ سرجان مالکم up to the end of Chapter XV احوال شاه سلطان حسین مرزا

(*d*) Literary Criticism :

Shibli : Sherul Ajam, Vols. I, II, III, IV and V.

Paper VIII.—Essay on a literary subject.

NOTE.—Critical questions will be set in Papers I, II, III and VI. A sound knowledge of Syntax, Prosody and Rhetoric shall be expected.

SANSKRIT.

(*For the Previous and Final Examinations of 1943.*)

There will be *eight* papers as follows :—

I Vedic Literature and Elements of Comparative Philology.
II. Classical Literature
III. Indian Philosophy.
IV. Literary and Cultural History of Ancient India.
Either Group A.—Sanskrit Language and Literature
V. Rhetorics and Prosody.
VI. Drama and Dramaturgy.
VII. Kavya and Grammar.

Or Group B —Philosophy.
V. Nyaya and Vaisesika.
VI. Sankhya and Yoga.
VII. Vedanta and Mimamsa.
VIII. Sanskrit Composition and Translation from English to Sanskrit

Paper VIII shall be offered in the Final year only. Candidates can offer any other four papers in the Previous and the remaining three papers in the Final examination subject to the following restrictions :

(1) Candidates offering one or more papers of the A Group in the Previous shall have to offer Paper II as one of the four papers for the Previous examination.
(2) Candidates offering one or more papers of the B Group in the Previous shall have to offer Paper III as one of the four papers for the Previous examination.

Paper I.—Vedic Literature and Elements of Comparative Philology.

(*a*) Vedic Literature :—

PETERSON : Hymns from the Rigveda (Bombay Sanskrit Series, No. XXXVI). Hymns Nos. 2—8, 10, 12, 14, 19, 20, 23, 24, 26, 28—30, 32-34.

(*b*) Elements of Comparative Philology :—

The outlines of scope, mechanism of speech, phonetic laws and classification of languages with special reference to the Indo-Aryan group.

Books recommended—

JAHAGIRDAR: An Introduction to the Comparative Philology of Indo-Aryan Languages (Oriental Book Agency, Poona).

MANGAL DEVA SHASTRI: Tulanatmaka Bhasha-vijnana or Bhasha-Sastra.

Paper II.—Classical Literature.

Magha: Sisupalavadha, Cantos III and IV.

Bhatti Kavya, Cantos I and II.

Bhavabhuti: Uttara-Ramacharitam.

Yajnavalkya: Acaradhyaya, the following Prakaranas:—

Upodghata, Brahmacari; Vivaha, Grihasthdharma, Snatakadharma and Rajadharma.

Paper III.—Indian Philosophy.

Katha Upanishad with Sankarabhashya.

Kesava Misra: Tarkabhasha.

Sadananda: Vedantasara.

Paper IV.—Literary and Cultural History of Ancient India.

Books recommended—

WINTERNITZ: History of Indian Literature, Vol. I.

MACDONNELL: India's Past.

PAUL MASON OURSEL HELENA DE WILLMAN, GRABOWSKA AND PHILLIPPE STERN: Ancient India and Civilisation (Kegan Paul).

KEITH: History of Sanskrit Literature.

R. K. MUKERJI: Hindu Civilization.

Either GROUP A.—SANSKRIT LANGUAGE AND LITERATURE.

Paper V.—Rhetoric and Prosody.

(*a*) Rhetoric—

Kavyaprakasa.

Books recommended—

P. V. KANE: History of Alankara Literature.

S. K. DEY: Sanskrit Poetics, Vol. II.

(*b*) Prosody—

Book recommended—

Srutabodha.

Paper VI.—Drama and Dramaturgy.

(*a*) Drama—
Mricchakatika.
Ratnavali.
Venisamhara.

(*b*) Dramaturgy—
Bharata : Natyasastra, Chapters I and II.
Dhananjaya : Dasarupakam.

Paper VII.—Kavya and Grammar.

(*a*) Kavya—
Naishadha, Cantos I to III.
Kadambari, Purvabhaga.

(*b*) Grammar—
Sidhantkaumdi—Karaka.
Laghukaumudi : Kridanta and Samasa.

Or GROUP B.—PHILOSOPHY.

Paper V.—Nyaya and Vaiseshika.

Vatsyayana : Nyaya Sutras with Bhashya, Chapter I.
Visvanatha : Nyaya Sidhantamuktavali up to the end of Anumanakhanda.
Sankaramisra : Vaiseshikasutra with Upaskara, Chapter I.

Recommended—
Tarkasangraha, edited by Bodas.

Paper VI.—Sankhya and Yoga.

Vacaspati Misra : Sankhyatattvakaumudi.
Bhoja : Yogasutravrtti, Chapters, I, II, III (only 1-15 Sutras) and IV.

Paper VII.—Vedanta and Mimamsa.

Sankara : Brahmasutra with Sarirakabhashya, Adhyaya I, Pada 1, Sutras 1-4, and Adhyaya II, Padas 1 and 2.

Laugakshibhashkara : Arthasamgraha, edited by D. V. Gokhale (Oriental Book Agency, Poona).

Paper VIII —Sanskrit Composition and Translation from English to Sanskrit.

HINDI.

(For the Previous and Final Examinations of 1943.)

There shall be the following *eight* papers of which the Essay paper and the paper on detailed and critical study of special author or period must be taken in the Final examination and out of the remaining six papers, any four may be taken in the Previous examination and the other two in the Final.

Paper I.—Modern Texts.

RAM CHANDRA SHUKLA : Chintamani Essays, Nos. 3, 5, 6, 11—16.
JAI SHANKER PRASAD : Ajatshatru.
PREM CHAND : Godan.
AYODHYA SINGH UPADHYAYA : Priya Pravasa, Chapters X to XVII.
JAGANNATH DAS RATNAKAR: Uddhava Shatak.
MAITHILI SARAN GUPTA : Saket.
Books recommended for General study—
JAGANNATH PRASAD SHARMA : Hindi ki Gadya-shaili ka Vikas. (N. P. Sabha, Benares).
KRISHNA SHANKAR SHUKLA : Adhunik Hindi Sahitya ka Itihas.
LALLU LAL : Prem Sagar.
SADAL MISRA : Nasiketopakhyan.
INSHA ALLAH KHAN : Rani Ketki-ki-kahani.

Paper II—Mediæval Texts.

BEHARI LAL : Satsai.
TULSI DAS : Gitavali.
SENAPATI : Kavita Ratnakar (Hindi Parishad, Allahabad University).
RAM CHANDRA SHUKLA : Bhramara Gitasar.
Books recommeded for General study—
JANARDAN MISRA : Surdas (B N. National College, Patna).
RAM KUMAR VERMA : Hindi Sahitya ka Alochanatmak Itihas, Part I.

Paper III.—Old Texts.

CHAND BARDAI : Prithviraj Raso (Padmawati Samaya).
SHYAM SUNDAR DAS : Kabir Granthawali —Sakhies of Kabir.

MALIK MUHAMMAD JAYASI : (Padmawat). (N. P. Sabha, Kashi).

RAM VRIKSH SHARMA VENIPURI . Vidypati-padawali (Sahitya Karyalaya, Lahariasarai).

Books recommended for General study—

RAM KUMAR VERMA : Kabir ka Rahasyavad.

P. D. BARTHWAL : The Nirgun School of Hindi Poetry.

HARI HAR NIWAS DWIVEDI : Mahatma Kabir.

Paper IV.—Principles of Criticism and History of Literature.

SHYAM SUNDAR DAS : Sahityalochan (Revised edition).

SHYAM SUNDAR DAS : Rupak Rahasya.

PADUMLAL PUNNALAL BAKSHI : Hindi Sahitya Vimarsh.

SHYAM SUNDAR DAS : Bhasa aur Sahitya (portion on Literature only).

RAM CHANDRA SHUKLA : Hindi Sahitya ka Itihas (Revised edition).

R. C. SHUKLA : Kavya men Rahasyavad.

KANHAIYA LAL PODDAR : Alankar Manjari.

KANHAIYA LAL PODDAR : Ras Manjari.

Paper V.—Comparative Philology.

The following syllabus is prescribed : History of the Science ; Language and its origin ; Classification of Language ; Internal and External changes ; Causes of change in Language ; Phonetic changes ; Semantic changes ; Morphological Development of Language ; History of Indo-Aryan Languages with Special reference to Hindi ; Development of Hindi and Elements in the Vocabulary of Hindi.

Books recommended—

SHYAM SUNDAR DAS : Bhasha Vigyan (Revised edition).

MANGAL DEO : Tulanatmak Bhasha Shastra.

I. J. S. TARAPOREWALA : Elements of the Science of Language (Calcutta University Publication).

SHYAM SUNDAR DAS : Bhasha aur Sahitya (portion on language).

JASPERON : Language—Its nature, development and origin.
DHIRENDRA VARMA : Hindi Bhasha ka Itihas. (Hindustani Academy, U. P. Allahabad).

Paper VI —Detailed and critical study of special author or period.

Any one of the following authors :—

Tulsi, Keshava, Sur, Bharatendu Harish Chandra *or* Jai Shankar Prasad

Paper VII.—(*a*) A Subsidiary Modern Indian Language ;

Or

(*b*) A Basic Language ;

Or

(*c*) An additional author or period (recommended under Paper VI) other than the one offered for Paper VI.

(*a*)—Subsidiary Languages :

Urdu—

CHAKBAST :Mazamin-i-Chakbast.
ALIAS BARNI : Musaddas-i-Hali.
HALI : Muqaddama Shair-o-Shairi.
Ab-e-Hayat, Pages 1—128
RAM BABU SAKSENA : Tarikh-i-Adab Urdu, translated by Mirza Mohammad Askari, (Newul Kishore Press, Lucknow , Chapters II and III (pp. 1—57)

Marathi—

R. KIRLOSKAR : Shakuntala.
N. N. APTE : Usha Kal.
N. KELKAR : Abhinava Kavyamala, Part IV.
G. G. AGARKAR : Nibandhamala, Part I.

Bengali—

RABINDRA NATH TAGORE : Balaka.
BANKIM CHANDA CHATTERJEE : Bish Briksha.
HARA PRASAD SHASTRI : Bharat Mahila.
D. L. ROY : Chandra Gupta.

(*b*) Basic Languages.

Sanskrit—

Raghuvansam, Canto XIII.

V. ANANTACHARYA : Chandrapidacharitam.
Shakuntalam, Act IV.
KALE : Smaller Grammar of Sanskrit.
RAM BEHARI LAL : Sanskrit Dwitiya Pustakam.

Pali—

Palipathavali ; up to Makhadeo Jatak, page 38 and Padhan Sutta, Dhamiya Sutta and Dhammapada, pages 91 to 98.
ADYA DATTA THAKUR : Palıprabodh.
C. V. JOSHI : A Mannual of Pali (Oriental Book Agency, Poona).
N. V. TUNGAR : Jatak Samgraha, first twelve lessons only (Oriental Book Agency, Poona).

Paper VIII.—Essay on an advanced literary subject.

URDU.

(For the Previous and Final Examinations of 1943).

There shall be the following *eight* papers of which the Essay paper and the paper on detailed and critical study of special author or period must be taken in the Final examination, and out of the remaining six papers, any four may be taken in the Previous examination and the other two in the Final.

Paper I.—Modern Texts

Poetry—

1. Maulana Hasrat Mohani : Intikhab-i-Sukhan Vol. XI.
2. Qasaid Aziz Lucknavi (First five Qasidas)

Prose—

3. Dr. Sir Iqbal . Bang-i-Dara, omitting—

تصویر درد — شمع و شاعر — گورستان شاهی — خضر راہ — طلوع اسلام — غزلیات — ظریفانہ۔

RATAN NATH SARSHAR : Jam-i-Sarshar
ABUL KALAM AZAD : Taza Mazameen
RASHID-UL-KHERY : Manazelusaira.
SHARAR : Mazamin-i-Sharar, Vol IV.

(ادب و تحقیق مسایل)

Paper II.—Detailed and Critical Study of Special author or period—GHALIB.

Books to be consulted for Special study of Ghalib—

۱ یادگار غالب از مولانا حالی۔
۲ شرح دیوان غالب از مولانا علی حیدر نظام طبا طبائی۔
۳ محاسن کلام غالب از ڈاکٹر عبدالرحمان بجنوری۔
۴ نکات غالب از نظام‌الدین حسین نظامی بدایونی۔
۵ غالب از ڈاکٹر سید عبداللطیف پروفیسر جامع عثمانیه حیدرآباد دکن۔
۶ غالب اور اسکی شاعری از مرزا محمد عسکری بی اے لکھنوی۔
۷ منتخبات غالب شائع کرده رام پرشاد بک سیلر آگره۔

Paper III —Principles of Criticism and the General History of Urdu Literature, etc.

HALI :—Muqaddam-i-Shair-o-Shairi
MOHI-UDDIN QADRI : Rooh Tanqid.
AZAD : Ab-e-Hayat.
ABDUS SALAM NADVI : Sherul-Hind, Vols I and II.

Paper IV.—Comparative Philology of Modern Indian Languages

Encyclopædia Britannica, Eleventh edition. (Articles on Grammar, Philology and Hindustani).
GRIERSON : Linguistic Survey of India, Vols. VI and IX (Part III).
M. SYED AHMAD DEHLVI : Ilm-ul-lisan
M. ZAKA-UL-LAH DEHLVI : Taqwim-ul-lisan.
M. AHMAD-UD-DIN : Sar Guzashte Alfaz.
KHWAJA ABDUL RAUF ISHRAT : Islah-e-zoban Urdu.
HAMID-UL-LAH KHAN YUSUFZAI : Lisan and Mutala-i-Lisan

Paper V.—Old Texts.

Poetry—

انتخاب کلام میر مرتبه مولوی عبدالحق بی اے دهلوی
دیوان میر درد (صرف غزلیات)۔
سودا—
۱ سنگ کو اپنے لئے کرتا ہے پانی آسمان۔
۲ جون غنچه آسمان نے مجھے بهر عرض حال۔
۳ مستغنی ذاتی نه مہوس کی هو تسخیر۔

۴ کہے ہے کاتب دوران سے منشي تقدیر-
۵ سواے خاک نہ کھینچونگا منت دستار-

Prose—

۱—باغ وبہار میر امن دہلوي معہ مقدمہ مولوی عبدالحق بی اے-
۲ فسانۂ عجائب -

Paper VI.—Mediæval Texts.

Poetry—

انتخاب سخن جلد ششم مرتبہ مولانا حسرت موہانی
مثنوي گلزار نسیم-
ردیف (Dewan of Momin Ghazals only)
الف - میم - نون - واو - ها - یا -

قصائد زوق

۱ دل کہ اس دیر میں ہے گرسنۂ ناز بتاں
۲ پیري میں پر ضرور ہے جام شراب ناب
۳ زہے نشاط اگر کیجئے اسے تحریر
۴ لاتا نیرنگ سے ہے رنگ نئے چرخ محیل-
۵ پائے نہ ایسا ایک بھی دن خوشتر آسماں-

Prose—

NAZEER AHMAD : Majmua Lectures, Vol. I
Khutut Sir Syed.

Paper VII.—A Subsidiary Modern Indian Language ;

Or

A Basic Language.

(*a*) Subsidiary Languages :

Hindi—

TULSIDAS : Ramayan (Ajodhya Kand).
HARISHCHANDRA : Satya Harishchandra.
MAITHILI SARAN GUPTA : Jayadratha Badha
PREM CHAND : Sapta Saroj.

Marathi—

R KIRLOSKAR : Sakuntala.
N N. APTE : Usha Kal.
N. KELKAR : Abhinava Kavyamala, Patt IV.
G. G. AGARKAR : Nibandhamala, Part I.

Bengali—

RABINDRA NATH TAGORE : Sonar Tari

BANKIM CHANDRA CHATTERJEE : Kapal Kundala
HARA PRASAD SASHTRI : Bharat Mahila.
D. L. ROY : Shahjahan.

(*b*) Basic Languages :

Arabic—

Arabian Nights— First 20 nights only
ABDUL RAHMAN AMRITSARI: Arabic Grammar.

Persian—

(1) سیر المتاخرین (شامل نصاب امتحان انٹر میڈیٹ بورڈ-الہ آباد)
(2) Farsi Jadeed, Vol. II.

Paper VIII.—Essay on an advanced literary subject.

PHILOSOPHY.

(*For the Previous and Final Examinations of 1943.*)

There will be *seven* papers. One of the papers shall be an Essay on a Philosophical subject. The Essay shall be taken at the Final Examination. Of the rest, *any three* may be taken in the Previous and the *remaining three* will be taken in the Final The papers shall be as follows :—

Paper I —Ethics.

(*a*) *Modern Ethics*—

BROAD, C. D. : Five Types of Ethical Theory (Kegan Paul).
RASHDALL : Theory of Good and Evil

Or

(*b*) *Ancient Ethics*—

PLATO : Republic—Jowett's translation. (O. U. P)
ARISTOTLE : Nicomachean Ethics—Ross's translation. (O. U. P.)
BURNET: Greek Philosophy—Thales to Plato

Paper II.—Psychology.

WARD : Psychological Principles (Cambridge).
WOODWORTH, R. S.: Contemporary Schools of Psychology (Methuen).
MACDOUGALL : Energies of Man.

NOTE.—Candidates are expected to know something of the attitude of Indian Philosophy to the psychological problems of perception.

Paper III.—Metaphysics.

LOCKE : Essay on the Human Understanding. (Selections, edited by Pringle Pattison).

FRASER : Selections from Berkeley (Selections from the Principles only).

HUME : Treatise, Part I.

WATSON : Selections from Kant (Critique of Pure Reason only).

Paper IV.—History of Modern Western and of Indian Philosophy.

THILLY : A History of Philosophy (Modern Period only, *i. e.* from p. 250).

HIRIYANNA : Outlines of Indian Philosophy.

CHATTERJI AND DATTA : Introduction to Indian Philosophy may also be consulted.

JOAD : Introduction to Modern Philosophy.

NOTE —Students are expected to relate their study to modern tendencies of thought and for this purpose Joad's Introduction is recommended It is not intended to be an additional text-book

Papers V and VI.—*Any two* of the following :

(*a*) Logic.

JOSEPH : An Introduction to Logic (O. U. P.)

STEBBING : A Modern Introduction to Logic (Methuen), Revised edition.

(*b*) Indian Philosophy.

Vedanta Sutra with Shankarabhasya, Adhyaya I, Pada 1, Sutras 1-4 : Adhyaya II, Padas 1 and 2.

DAS GUPTA : History of Indian Philosophy, Vol. I.

(*c*) Philosophy of Religion.

PRINGLE PATTISON : Idea of God.

CAIRD : Introduction to Philosophy of Religion.

SELBIE, W. B. : Psychology of Religion.

(*d*) Special Philosopher : Bradley.

BRADLEY : Appearance and Reality.

Paper VII.—Essay.

Under the Essay, sufficient choice would be given on problems connected with the various branches of the subject.

ECONOMICS.

(For the Previous and Final Examinations of 1943.)

There shall be *eight* papers, out of which a candidate shall be required to take four papers in the Previous and four papers in the Final Examination as specified below :—

I. Of the following three papers, either (*a*) or (*b*) shall be taken in the Previous and *the other* and (*c*) in the Final Examination :—

(*a*) Principles of Economics.
(*b*) History of Economic Thought, including History of Socialism.
(*c*) Essay.

II. Of the following papers, *any three* may be taken in the Previous and *any two out of the remaining* in the Final Examination :—

(*a*) Economic Development and Present Economic Conditions of India and England.
(*b* Financial Organization.
(*c*) The State and Economic Welfare.
(*d*) Labour Problems and Social Welfare.
(*e*) Rural and Municipal Economics.
(*f*) Theory and Practice of Statistics.
(*g*) Co-operation.
(*h*) Transport.
(*i*) International Trade and Foreign Exchange.

NOTE —Books marked with an asterisk (*) to be read , others only to be consulted

Paper I *(a).—Principles of Economics*—Theory of consumption Natural resources, human beings, and capital goods as economic factors. Theory of population Organisation of industry. Industrial combination. Markets and trading. Theory of value Joint-product prices Monopoly price. Discriminating price. Money and prices. Credit and banking. International trade and foreign exchange. Theory of distribution. Speculation. Organised markets. Forms of business organisation. Control of monopolies. Principles of Economic Planning.

Books recommended—

*MARSHALL : Principles of Economics, Books 1, III, V.
*FISHER : The Nature of Capital and Income.

*Pigou : The Economics of Welfare, Part I
Clark : Essentials of Economic Theory.
*Taussig : Principles of Economics
Cannan : Wealth
Brown : International Trade.
Carr-Saunders : World Population.

Paper I (*b*).—*History of Economic Thought*, including the History of Socialism.—Mercantilism. The Physiocrats. Adam Smith and the Manchester School, Malthus, Ricardo, Carey, Bastiat. Senior, Sismondi, List. Utopian or Bourgeois Socialism : Saint-Simon, Fourier, Owen. Proletarian Socialism. Louis Blanc. Prodhon. John Stuart Mill, Marshall. Economic Thought in the 20th century. Scientific Socialism : Rodbertus, Lassalle, Karl Marx. The German Historical School : Roscher, Hildebrand, Knies Schmoller. The Austrian School : Menger Wieser, Bohm-Bawerk. Modern Socialism.

Books recommended—

*Haney : History of Economic Thought.
Gide and Rist : History of Economic Doctrines.
Othmar Spann . Types of Economic Theory.
Cannan :Review of Economic Theory.
Brij Narain : Tendencies in recent Economic Thought (Delhi University).
Urangyi Sanger : Economics in the 20th Century.
Tugwell : Trend of Economics.
Markham : History of Socialism.

Paper I (*c*).—*Essay.* A large number of general subjects shall be the topics for essay, out of which a candidate will have to choose one. These subjects should be so chosen as to have at least one from the subjects prescribed under Groups I and II in the course

Paper II (*a*).—*Economic Development and present economic conditions of India and England* with special reference to the period after 1760.—The Manor The Guilds. The Domestic System. The Agricultural Revolution. The Industrial Revolution. A broad outline of the development in India of the Industries of Jute, Cotton, Sugar, Iron, Steel and Coal. The Factory System. Changes in Transportation and Marketing, and their effects. Similar material for India, as far as possible. Brief history of the inventions between 1760 and 1790,

and their economic effects. The State and labour. The modern economic structure. Trade unionism. Wage contracts ; Public finance. Tariff. The history of inventions and of the status of labour to be treated briefly from relevant chapters in Economic History of England by Meredith.

Books recommended—

*Meredith : Economic History of England.
Vera Anstey : Economic Development of India.
*Gadgil : The Industrial Evolution of India.
Knowles : The Industrial and Commercial Revolution (in Great Britain during the 19th Century).
Ashley : Economic Organisation of England.
*D. H Buchanan : Development of Capitalistic Enterprise in India.

Paper II (*b*).—*Financial Organization* :—

Social importance of money. Principles of currency circulation. Services and nature of money movements and distribution of money. Value of money. Stability of the value of money. Credit and prices. Measurement of variations in the value of money. Deferred payments. Bi-metallism. Convertible and inconvertible paper money.

The Processes of inflation and deflation. Their effects on the value of gold, prices, foreign exchanges, purchasing power parity, international trade, and State finance. Stabilisation of monetary standards. Effects of international debts.

Brief history of Indian currency up to 1893. Measures taken in 1893 and 1899. The gold exchange standard. The gold standard reserve. Amalgamation of the gold standard and paper currency reserves. Council and Reverse Council Bills. The proposed gold bullion standard.

Banking : organization, operation. The cheque system. Bank notes. Convertibility. Reserve system : fixed, fiduciary and proportional. The Indian banking system ; the Imperial Bank of India, joint- stock banks, exchange banks, Government Treasury system, indigenous banking, co-operative banks, savings banks. The Reserve Bank.

Books recommended—

*B. E. Dadachanji : Indian Currency and Exchange.
Spalding : Eastern Exchange, Currency and Finance.
Cole : Money.

PAUL EINZIG : Exchange Control.
PAUL EINZIG : Bank for International Settlements (Fourth edition).
E. M. BARNSTEIN : Money and the Economic System (Chapel Hill, The University of North Carolina Press).
KISCH AND ELKIN . Central Banks (Fourth edition).
Report of the Central Banking Enquiry Committee.
PAUL EINZIG Monetary Reform.
MACFIE Theory of Trade Cycles.

Paper II (c).—*The State and Economic Welfare.*—(This course is a study of the relative efficiency of public and private activities as a means to certain economic ends). Taxes and other kinds of revenue. Their effects upon production and distribution and their other effects. Public Expenditure . Its effects upon production and distribution. The economic basis of expenditure for the security of life and property, for sanitation and education. Loans and Budgets. Social Insurance, including workmen's compensation and insurance against unemployment. Government regulation of Production. Adulteration. Control of food and drugs. Factory Legislation. Prices and Monopolies. State aid to industries. Public Research and Information Bureau. Government Control of Public Works and Public Utilities. Indian Finance : Decentralization, Provincial contracts. Changes since 1920. Meston award. Financial position of the Provinces. Financial changes under the Government of India Act, 1935.

Books recommended—

SHIRRAS . The Science of Public Finance.
'CLOW . History of Factory Legislation in India.
Report of the Taxation Enquiry Committee.
DALTON : Public Finance.
SEAGER : Social Insurance.
PIGOU . Economics of Welfare (Chapters dealing with Government control).
Indian Workmen's Compensation Acts.
Indian Factory Acts.
SILVERMAN . Economics of Social Problems.
AMBEDKAR : The Evolution of Provincial Finance in British India.

CLOW : State and Industry.
THOMAS : Federal Finance in India.

Consult—

ADARKAR . Federal Finance in India.
J. P. C. Report

Paper II (*d*) —*Labour Problems and Social Welfare.*— Life of the Labouring Classes in Typical Indian Industries. Wages and hours. Trade Unionism · Their Principles, achievements, and possibilities in England and India. Labour Disputes. Arbitration and Conciliation. Works Committees and Trade Councils. Profit-sharing, Co-partnership, and Producers' Co-operation. Social Welfare Work, and Social Service Agencies in India. Housing projects in India and England. Debt and Co-operative Credit for Employees. Unemployment. Labour Agencies and Labour Exchanges. (Social Insurance. Workmen's Compensation, and Factory Legislation, which are included in the course, are to be reviewed briefly) Methods of paying wages.

Books recommended—

CLOW : History of Factory Legislation in India.
COLE : History of Working Class Movement in England, Parts I—III.
PIGOU . Economics of Welfare, Part III.
A. WILLIAMS : Co-partnership and Profit-sharing.
Reports on Social Welfare. Work of the Calcutta and Bombay Leagues. The Tata Iron and Steel Company and the British India Corporation, Cawnpore.
NETTLEFOLD . Practical Housing.
Report of the Indian Labour Commission.
Industrial Labour in India (I. L. O.)
Industrial Relations in England by Richardson(I.L,O.)

Paper II (*e*).—*Rural and Municipal Economics.*— Land Tenures. Agricultural Improvements, Irrigation and Communications. The importance and possibilities of village industries. District Board finance. Contrast between Rural and Municipal Problems. Congestion, Town Planning, Building Regulations, Sanitation, Municipal Finance. Consolidation and sub-division of holdings. Livestock and Agriculture. Water power. Marketing of Agricultural products. Financing of Agriculture. Short

and long term loans. Land mortgage banks. Forests. Soil erosion. Famines : history and preventive and remedial measures. Village industries: present condition, causes of decay, lines of improvement. State in relation to Agriculture. Demonstration farms

Books recommended—

DARLING : The Punjab Peasant in Prosperity and Debt

NOURSE : Agricultural Economics.

HEARNE : The Existing Constitutional system of British India.

BADEN POWELL : Land Revenue System of British India.

U. P. Municipal Manual.

U P. District Board Act.

U. P District Board Manual.

U. P. Tenancy Act. 1939.

FIVER : Municipal Trading (Allen and Unwin).

GANGULEE : Trends of Agriculture and population in the Ganges valley (Rama Krishna & Sons, Lahore)

Report of the Royal Commission on Indian Agriculture

Paper II (*f*).—*Theory and Practice of Statistics*—Scope and utility of statistics. Enumeration, compilation and tabulation of data. Averages. Dispersion. Skewness. Graphic Method. Accuracy. Index numbers. Interpolation. Association. Contingency. Correlation. Sampling. Common errors in Statistics.

Books recommended—

BOWLEY : Elements of Statistics

BOWLEY : Elementary Manual of Statistics (Second edition).

YULE : An Introduction to the Theory of Statistics.

Harvard Economic Series—Review of Economic Statistics.

SECRIST : Introduction to Statistical Methods.

Statistical Abstracts for British India.

BODDINGTON : Statistics for Commercial Students.

BOWLEY and ROBERTSON : Report on the Census of Production in India.

Paper II (*g*).—*Co-operation.*

HISTORICAL.—Robert Owen. Communistic Colonies. The Rochdale Pioneers. The English Co-operative Wholesale Society; Raiffeisen and Schulze-Delitzsch systems. Outline of Irish, Swedish and Danish systems.

THEORY.—Co-operative Production. Industrial Co-operation. Co-operation in Agriculture. Co-operative Marketing. Co-operative Distribution. Co-operative Credit.

INDIAN.—Co-operative Organization. Primary Rural Societies. Provincial and Central or District Banks.

Books recommended—

*C.R. FAY: Co-operation at Home and Abroad, Vols. I and II.

KAJI : Co-operation in India.

H. CALVERT : The Law and Principles of Co-operation in India.

*Report of the McLagan Committee on Indian Co-operation.

JOHN MATTHAI : Agriculture Co-operation in India.

TALMAKI : Co-operation in India and Abroad.

MARQUIS CHILDS : Sweden, the middle way.

BAROU : Co-operative Banking (P. S. King & Sons).

INDIAN Co-operative Review (Madras).

Paper II (*h*).—*Transport.*

RAILWAY —Capital and working expenses. Application of the laws of productivity. Combination. Competition and monopoly in transport. Determination of rates and fares. Classification of goods, State regulation of rates and fares. State ownership and management.

INDIAN RAILWAYS.—Present situation. Finance. Controlling authority. Determination of rates and fares. Systems of management.

ROAD.—Transport of goods and merchandise. Types of vehicles. Rural transport. City transport. The motor bus. The tramway. Competition and monopoly in road transport. Determination of rates and fares. Classification, administration, and maintenance. Taxation of road vehicles. Water transport—inland and oceanic.

WATERWAYS.—Inland and coastal (Indian).

Books recommended—

*DOUGLOUS KNOOP : Outlines of Railway Economics.

*ACWORTH : Elements of Railway Economics.

*MARSHALL : Industry and Trade, Book III, Chapters 3-6.
'FENELON : Economics of Road Transport.
FENELON : Transport Co-ordination.
SRINIVASAN : Theory of Rates and Fares in India.
KIRKNESS AND MITCHEL : Report of the Road and Railway Competition Committee.
Co-odination and Development of Transport (Final Report), H. M. S Office, London, 1931.
Proceedings of the Railroad Conference, 1933.
The Indian Motor Vehicles Act, 1939.
Wedgwood Committee Report on Indian Railways.
S. N. HAJI : Economics of Shipping.
FENELON . Economics of Rail Transport.

Paper II *(i).—International Trade and Foreign Exchange.*—International trade : theory, comparative costs. Interpretation in terms of goods and prices. Advantages and disadvantages of international trade. Effects of the operation of the laws of increasing and diminishing returns upon international trade. International value. Money in international trade. Effects of price variation on the course of international trade.

Foreign Exchange.—Par of Exchange : Mint par of exchange in cases of currencies of different metals and inconvertible paper money. Fluctuations of exchanges : causes ond correctives.

Tariff Policy.—Free trade, protection, Imperial preference, dumping.

Books recommended—

*BASTABLE . Theory of International Trade.
TAUSSIG . International Trade.
CLARE and CRUMP : A B. C. of Foreign Exchange.
Report of the Indian Fiscal Commission.
BARRATT WHALE : International Trade.
PAUL EINZIG : Exchange Control.
PAUL EINZIG : Exchange Clearing.
BERTIL OHLIN : Interregional and International Trade.
THOMAS . Principles and Arithmetic of Foreign Exchange.
KINDLEBERGE : International Short term Capital movements (Columbia Un. Press).

HISTORY.

(For the Previous and Final Examination of 1943.)

Paper I.—Modern Political Theory (From Herbert Spencer to the present day) and institutions, including the Modern Constitutions of England, Canada, U. S. A., Switzerland, and France.

LASKI : Grammar of Politics, Part I.

BARKER : Political Thought in England—From Spencer to the Present Day.

FINER : Theory and Practice of Modern Government (abridged edition in one volume).

F. W. COKER : Recent Political Thought.

Paper II.—A selected period of English History—1815-1914.

MARRIOTT : England since Waterloo.

Cambridge History of British Foreign Policy (relevant portions).

WOODWORD : The age of Reform (O. U. P.)

STRACHEY : Victoria.

TREVELYAN : British History in the Nineteenth Century.

The Cambridge Modern History (relevant portions).

GILBERT SLATER : Making of Modern England (New edn.)

R. C. K. ENSOR : England, 1870-1914 (O. U. P.)

Paper III —A selected period of European History.

(*a*) Revolutionary and Napoleonic Era, 1789-1815.

MADELIN : French Revolution

MADELIN : The Revolutionaries.

FOURNIER : Napoleon

ACTON : Lectures on the French Revolution.

YOUNG : Travels in France

FISHER : Bonapartism.

Cambridge Modern History, Vols. VIII and IX.

MADELIN : The Consulate and the Empire, Vols. I and II.

Or

(*b*) Contemporary Europe, 1871-1914.

TURNER : Europe since 1870

ROSE : Development of European Nations.

Cambridge Modern History, Vol XII.

GOOCH : History of Europe.

GOOCH : Before the War, Vol I

Papers IV and V —*One* of the following periods of Indian History, each period comprising two papers :—

A —ANCIENT INDIA.

(*a*) The Maurya Empire.

KAUTILYA : Arthashastra
MEGASTHENES : Indica.
Cambridge History of India, Vol. I.
BHANDARKAR : Asoka.
MUKERJI : Asoka.
HULTZSCH : Inscriptions of Asoka (Revised Edition).
H. C. ROY CHOWDHURY : Political History of Ancient India (1938 edition).

(*b*) The Gupta Empire.

FLEET : Gupta Inscriptions.
ALLAN : Gupta Coins.
FA HIEN : Travels (tr. by Giles).
H. C. ROY CHOWDHURY : Political History of Ancient India, 1938 edition (relevant portions).
R. G. BASAK : History of North-East India.
R. D. BANERJEE : Age of the Imperial Guptas.

B.—MEDIAEVAL INDIA.

(*a*) Pre-Mughal India, 1200—1526.

ELLIOT AND DOWSON : History of India, Vols. II, III and IV.
BRIGGS : Rise of Mohammedan Power.
TARA CHAND : Influence of Islam on Indian Culture.
R. P. TRIPATHI : Some Aspects of Muslim Administration.
ISHWARI PRASAD : History of the Qarauuah Turks in India.
TODD : Annals and Antiquities of Rajasthan (ed. by Crooke)
Tabkat-i-Nasiri (translated by Raverty).
KING : History of the Deccan.
Ibn Batuta (translated by Lee).
The Cambridge History of India, Vol. III.
DORN : History of the Afghans.
MEHDI HUSAIN : The Rise and Fall of Muhammed Bin Tughluq.

(*b*) Mughal India, Babar to Jahangir

Memoirs of Babar.
Humayun Nama.
ABUL FAZAL : Akbar Nama.

ABUL FAZAL : Ain-i-Akbari.
Memoirs of Jahangir.
ELLIOT AND DOWSON : History of India, Vols. IV—VI.
TARA CHAND : Influence of Islam on Indian Culture.
R. P. TRIPATHI : Some Aspects of Muslim Administration.
Cambridge History of India, Vol. IV.

Or

C —MODERN INDIA.

(*a*) Indian History, from Clive to Wellesley.

Cambridge History of India, Vol. V.
FORREST : Clive.
JONES : Warren Hastings.
FORREST : Selections from papers of the Governors General-Warren Hastings and Cornwallis.
OWEN : Selections from Wellesley's Despatches.
ROBERTS : Life of Lord Wellesley.
The Fifth Report (Firminger's Edition).
NANDALAL CHATTERJEE : Mir Qasim.
C. DAVIS : Administration of Warren Hastings.
CHATTERJI : Verelst's Rules in India (Indian Press, Allahabad).

(*b*) India under the Crown, with special reference to Constitutional Development.

R. C. DUTT : India in the Victorian Age.
RONALDSHAY : Life of Lord Curzon, Vol. II.
LORD MORLEY : Recollections, Vol. II.
BANERJEE : A Nation in the Making.
KEITH : Constitutional History of India.
Cambridge History of India, Vol. VI.

Paper VI.—A special study paper, *one* of the following :—

(*a*) The History of the Marathas, 1627—1761.

SEN : Administrative System of the Marathas.
RANADE : Rise of the Maratha Power.
GRANT DUFF : History of the Marathas (O. U. P.)
ELLIOT AND DOWSON : History of India, Vols. VII and VIII.
SARDESAI : Main Currents of Maratha History (Revised Edition).
SINHA : Rise of the Peshwas.
SEN : Military System of the Marathas.

SARKAR : Shivaji and His Times (Revised Edition).

Or

(*b*) Economic History of India under British Rule.

BALKRISHNA : Commercial Relations between India and England.

HAMILTON : Trade Relations between India and England.

R. C. DUTT : Economic History of British India (1757—1837).

R. C. DUTT : Economic History of India in the Victorian Age.

GADGIL : Industrial Evolution of India in recent times.

ANSTEY : Modern Economic Development of India.

SINHA : Economic Annals of Bengal.

JETHAR AND BERRY : Indian Economics.

Paper VII —Essay

POLITICAL SCIENCE

(*For the Previous and Final Examinations of 1943.)*

There shall be *seven* papers, including one on Essay. The Essay must be taken in the Final Examination. Of the rest, *any three* may be taken in the Previous and the *remaining three* in the Final.

Paper I —Ancient and Mediæval Political Thought

PLATO : Republic.

ARISTOTLE : Politics.

DUNNING : A History of Political Theories, Vol I

BARKER : Plato and his Predecessors.

GIERKE : Political Theories of Middle Ages, with Maitland's Introduction.

HEARNSHAW : Some Mediæval Thinkers.

Paper II —Modern Political Thought.

HOBBES : Leviathan.

LOCKE : Second Treatise on Government.

ROUSSEAU : Social Contract.

J. S. MILL : Liberty.

MERRIAM AND BARNES : A History of Political Theories, Recent Times.

GREEN : Lectures on the Principles of Political Obligation.

BOSANQUET : Philosophical Theory of the State.
LASKI : Grammar of Politics (Part I only).
BUTRAND RUSSEL : Roads to Freedom.
FOLLETT : The New State.
VAWGHAN : Studies in the History of Political Philosophy, 2 Vols

Paper III.—Public Administration.
WILLOUGHBY : Principles of Public Administration.
D. BURNS : White Hall.
H. FINER : British Civil Service.
T. L. HEATH : The Treasury.
GYAN CHAND : The Financial System of India.
Manual of Procedure of the Legislative Assembly.
Government of India Act and rules made thereunder.

Paper IV.—Modern Constitutions of India, Great Britain, Australia, France, U. S. A. and Italy.
Government of India Act.
Rules made under the Government of India Act.
OGG : English Government and Politics.
BRYCE : Modern Democracies, Vo's. I and II.
FINER : Mussolini's Italy.

Papers V and VI.—*Any two* of the following :—

(1) Ancient Indian Political thought and Institutions.
Kautilya : Arthashastra (Translated by Sham Shastri).
Mahabharata, Santiparvam (Rajadharma).
Manusmriti, Chapter VII.
BENI PRASAD : Theory of Government in Ancient India.
BENI PRASAD : The State in Ancient India.
K. P. JAYASWAL : Hindu Polity.
RAMCHANDRA DIKSHITA : Hindu and Administrative Institutions.
VISHWANATH : International Law in Ancient India.
Cambridge History of India, Vol. I, Chapters IV, V, X, XI and XII.

(2) Development of Modern Indian Constitution (1858 to the Present Day).
SAPRE : The Growth of the Indian Constitution and Administration.
P. MUKERJI : Indian Constitutional Documents.
G. N. SINGH : Indian States and the Government of India.

G. N. SINGH : Landmarks in Indian Constitutional and National Development.
KEITH : Constitutional History of India, 1600—1935.
Government of India Act.
Rules made under the Government of India Act.

(3) Islamic Political Thought and Institutions.
ARNOLD : The Caliphate.
VON KREMER : Contributions to the History of Islamic Civilization.
IBN KHALDUN : Muqaddameh
ABDUL RAHIM : Muslim Jurisprudence.
AGHINIDES : Theories of Musalman Finance.
Cambridge Mediæval History : Vol. II, Chapter X; Vol. III, Chapter XVI; Vol. IV, Chapter X.

(4) Ancient and Madiæval Political Institutions.
SIDGWICK : Development of European Polity.
GREENIDGE : Greek Constitutional History.
GREENIDGE : Roman Public Life.
ARNOLD : Roman Provincial Administration.
Cambridge Ancient History (relevant chapters).
JENKS : Law and Politics during the Middle Ages.

(5) International Relations.
PEARS HIGGINS : Studies in International Law and Relations.
BUELL : International Relations.
TOYNBE : Survey of International Affairs.
HOWARD ELLIS : The Origin, Structure and the Working of the League of Nations.
STREET : Union Now.
GIBBON : Introduction to World Politics.
MOON : Imperialism and World Politics.

(6) Principles of Sociology.
GIDDINGS : Principles of Sociology.
TYLER : Primitive Culture.
HOBHOUSE : Social Development.
GINNSBERG : Social Psychology.
MAC DOUGALL : The Group Mind.
GRAHAM WALLAS : The Great Society.

Paper VII.—Essay.

MATHEMATICS.

(*Same* as for M. Sc).

B. T. EXAMINATION

(For the Examinations of 1942 and 1943.)

1. *Principles of Education*—The meaning of education. Modern conceptions of education. Aims of education considered with reference to the individual and the community; the influence of the school on the home and the after-life of the pupils; their training for leisure and citizenship.

Psychology and its bearing on education. Modern methods of psychological study as applied to education. The methods of experimental psychology.

Factors in education. Heredity and environment. The role of instinctive tendencies in education; sympathy, suggestion, imitation, curiosity, play. Attention and interest; the creation of interest. Habits. The emotions, sentiments and character.

The thought processes. Sensation and image, perception, imagination. Perceptual learning and conceptual thinking. Reasoning. The will.

Learning and its laws. Improvement in learning. Association and memory. Remembering and forgetting. The transfer of training. Fatigue in intellectual work.

Stages of child development. Adolescence.

Intelligence: Its nature and measurement. Intelligence and achievement tests. Co-efficient of correlation and its calculation. Measurement of improvement in different subjects.

Books recommended—

Ross: Groundwork of Educational Psychology.
Catty: The Theory and Practice of Education.
Drever: An Introduction to the Psychology of Education.
Drever: Psychology of Everyday Life.
Nunn: Education—Data and First Principles.
Sturt and Oakden: The Psychology of Education.
Loveday and Green: Psychology for Teachers.
Raymont: Principles of Education.
Jha: Modern Psychology.

2. *School Organization and Hygiene*—Time-tables; arrangement, balance of subjects, variations to suit special needs; open air work and excursions.

Types of school buildings and their relation to teaching and to physical training: use of halls and playgrounds; sanitary conditions and supervision.

Types of schools: large, small, urban, small town, large town. Forms of and differences in organization according to type.

The staff: allocation of work and distribution of staff; General and specialist teachers. Classification of scholars: methods of testing progress in various sbjects and at different times; promotion; class, school and office records. Registration.

Discipline and self-discipline: praise and blame: rewards and punishments: treatment of younger and older pupils respectively: methods of dealing with children of a special type, *e. g.* wilful, sulky, quicktempered, apathetic, lazy.

The maintenance of order. The secret of good order. The maintenance of attention and the creation and importance of interest. The cause of inattention. The teacher's personal influence and how it acts upon the child.

Training of older scholars in responsibility; opportunities of training character; methods of dealing with school offences: cultivation of corporate life: influence of games.

Hostels: their corporate life; physical and moral health therein; superintendence.

Health and physique of children as affecting and affected by education and school conditions. Factors influencing health and growth; direct and indirect means of cultivating good physical habits in school, *e. g.* attitude in writing and oral lessons; personal cleanliness, rest, etc. mental and physical fatigue in relation to lessons and games.

Anatomy: skeleton; bones and joints; muscular system; excretory system; blood circulation; respiration; digestion. Defects of eyesight and of hearing. The teeth and their care. Diseases of the nose and throat. Common minor ailments, their identification and treatment. Infectious diseases (including leprosy and tuberculosis); disinfection. Simple accidents; first-aid. Junior Red Cross; Mackenzie School Course. The hygiene of the school, the classroom,

and the surroundings; lighting; ventilation: water-supply; over-crowding of rooms. Sanitation of the school and hostel. Objects and method of medical inspection. The teacher's part in this.

Books for reference and study—

BAGLEY: Classroom Management.
BRAY · Organization.
WARD and ROSCOE: The Approach to Teaching.
SLEIGHT: Organization and Curricula.
RAYMONT · Modern Education, its Aims and Methods.
RYBURN: Suggestion for the Organization of Schools in India.
AVERY: Text-book of Hygiene for Training Colleges
LYSTER: Text-book of Hygiene for Teachers.
DRUMMOND School Hygiene.
MUKERJI: An outline of Secondary School Organization for Indian Schools.
The Educational Code of the Province.

3. *Methods of Teaching*—

PART I—Subjects of the curriculum and reasons for their inclusion; their relative importance at different periods of school life; correlation of subject with subject: variation in curricula to meet the needs of various types of schools, and scholars of different ages—the Primary, High Middle and Intermediate: Transition.

Methods of teaching in general · General Maxims of Method (*e. g.* simple to complex etc.). Inductive and deductive method. Heuristic method. The collective lesson: individual teaching: teaching in sections: group work and individual work: exposition and explanation: questioning and answering, dealing with answers: methods of dealing with mistakes, oral, written, or in construction etc.: narration and description. illustrations and illustrative aids, use of the blackboard, diagrams; relations between the scholar's own work and that of the teacher: encouragement of private study and working alone by the pupil: differences in methods according to the stage of the pupil. Homework, School libraries, their use. Recent development in methods: Frobel; Montessori; Dalton Plan; Project method; Play way.

Schemes of work—their preparation and methods of working out ; single lessons and series of lessons ; notes—full and working notes : revision methods and values.

PART II—Methods of teaching the various subjects of the curriculum of Secondary schools in India. Provision and use of apparatus.

(*i*) *English*—Early training in speech. Phonetics and its use. Direct method. Basic English. Reading at the various stages ; rapid reading : silent and oral reading ; test work. Consideration of the subject taught as a "foreign" language. Dictation, transcription and composition, oral and written. The teaching of writing. Correction of work, Literature—its place ; appreciation. The teaching of prose and poetry in the three stages. Grammar ; Translation ; the place of the mother-tongue in teaching English.

(*ii*) *History*—Why History should be taught in School : the different stages and selection of material therefor ; essentials of teachers' and pupils' work ; making the Past real ; the History Room : the Teaching of Civics ; Modern Developments and the Teaching of History in School.

(*iii*) *Geography*—The Modern Conception of Geography : the place of Geography in the school curriculum : stages and work at each stage : Story and Regional Methods : the place of pictures, models, sketches and other material aids : correlation of Geography with other subjects specially Nature Study and Handwork. The Home Region and Geographical Excursions : Use of Maps.

(*iv*) *Mathematics*—Methods and apparatus ; the teaching of principles : application of principles : practical, oral and written work. Correction of work. Means of securing accuracy.

(*v*) *Sciences*—Place of investigation and of information : indoor and outdoor work ; books and their use ; biography . selection of material for schools differently situated : connexion with gardening : excursions.

(*vi*) *A Modern Indian Language*—Means of securing clear articulation and accurate hearing ; the use of stories, oral and written composition ; reading aloud, silent reading ; recitation, training in the use of books, texts and more detailed study ; grammar and its place ; rapid reading ; cultivation through prose and poetry of a taste for literature. Aids to teaching. The teaching of calligraphy and prosody.

Books for study and reference—

"Suggestions" Board of Education.

MACNEE : Instruction in Indian Secondary Schools (New Edition).

THOMPSON and WYATT The Teaching of English in India.

FAWCETT : The Teaching of English in the Far East.

RIPMAN : English Phonetics.

CHAMPION : Lectures on Teaching English in India.

GREEN and BIRCHENOUGH : A Primer of Teaching Practice.

WELTON : Principles and Methods of Teaching.

ADAMS : The New Teaching.

ADAMS Modern Development in Educational Practice.

Books on special methods and separate subjects.

I. *History of Education*—

(*a*) Study of two Educators, Spencer and Dewey.

Familiarity with Western Educational thought, bearing on the theories of the two Educators, will be expected.

Books recommended—

(1) H. SPENCER : Education.

(2) DEWEY : The School and the Society.

(3) DEWEY : The School and the Child.

Books of reference—

BOYD : The History of Western Education.

DEWEY : Democracy and Education.

(*b*) A general review of Education in India from the beginning of the twentieth century to the present day. The following books, reports, etc. will be referred to :—

Meston : Indian Educational Policy—Its Problems and principles.

Mayhew : The Education of India (selected chapters).
Paranjpe ; A Source Book of Modern Education. 1797—1902.
Saddler : Calcutta University Commission Report.
The Hartog Committee Report.
James : Education and Statesmanship in India.
S. N. Chaturvedi : History of Rural Education in the United Provinces.
F. W. Thomas : British Education in India, 1891.
Mahmood : A History of English Education in India, 1781—1893.
Fleming : Schools with a Message in India.
Departmental Reports: Report of the Wardha Scheme.
Sapru The United Provinces Unemployment Committee Report.

B. Sc. EXAMINATION, 1943.

MATHEMATICS.

There will be *three* papers :—

I. (*a*) *Algebra.*—Inequalities, Simple continued fractions, Elementary theorems on convergence and divergence of series ; Binomial theorem for any rational index ; Exponential and logarithmic series ; Partial fractions and easy determinants.

(*b*) *Analytical Geometry.*—Straight line, circle, parabola, ellipse, hyperbola and the reduction of the general equation of the second degree to standard forms. The above to be treated by rectangular and polar co-ordinates only.

(*c*) *Trigonometry.*—Inverse trigonometrical functions, De Moivre's theorem, summation of trigonometrical series, hyperbolic functions, expansion of trigonometrical functions.

II. (*a*) *Differential Calculus.*—Limits, differentiation of a function of a single variable, successive differentiation, use of Taylor's and Maclaurin's theorems, indeterminate forms, maxima and minima for a single variable, partial differentiation, tangents, normals, asymptotes, double points, curvature, envelope and simple curve tracing.

(*b*) *Integral Calculus*—Standard forms ; methods of substitution, Integration by parts, and easy reduction formulæ. Rectification of plane curves, quadrature, surfaces and volumes of solids of revolution.

(*c*) *Differential Equations.*—Ordinary differential equations of first order and first degree, and linear equations with constant co-efficients.

III. (*a*) *Statics.*—General conditions of equilibrium of a particle and of a rigid body under the action of forces in one plane, virtual work, friction, centre of gravity, common catenary, Hooke's Law.

(*b*) *Dynamics of a Particle.*—Velocity and acceleration, Newton's Laws of Motion, work and energy, rectilinear motion, projectiles in vacuum, circular and harmonic motions, simple and cycloidal pendulums, impact.

(c) *Hydrostatics.*—Fluid pressure, pressure on immersed surfaces, conditions of equilibrium of a floating body, centre of pressure.

Or

Elementary Astronomy.—Celestial sphere, fundamental definitions, the Earth, the Sun, and the solar system, determination of the first point of Aries, the Moon, Eclipses, Time, determination of terrestrial latitude and longitude by simple methods.

Note —No knowledge of Spherical Trigonometry is required

Books recommended—

PARKAR : Astronomy.

BARLOW AND BRYAN : Mathematical Astronomy.

PHYSICS.

The examination will cosist of *two* papers and a practical test. Candidates must obtain minimum pass marks in the practical examination as well as pass in the total of the theory papers.

The subjects of the papers will be—

Paper I. General Properties of Matter, Sound and Heat.

Paper II. Light, Electricity and Magnetism.

The following is the detailed syllabus—

General Properties of Matter.—Law of Gravitation. Determination of the gravitation constant. Elementary problems on attraction, *e. g.*, attraction of a sphere and spherical shell on internal and external points, attraction of any closed surface on a point just outside. Definition of potential and its determination in simple cases. Definition of equipotential surface and lines of force, and elementary propositions connected therewith Definition of Elasticity : Hooke's Law. Modulus of rigidity. Young's Modulus. Theory of the bending of a rod supported at both ends. Bulk modulus. Definition of Moment of Inertia and Radius of Gyration. Calculation of Moment of Inertia of a sphere, a rectangular bar and a cylinder about any axis. Modern vacuum pumps. Oscillations of a simple pendulum and simple harmonic motion. Compound Pendulum. Surface tension and its determination. Definition of Viscosity.

Determination of the viscosity of liquids by the flow through a capillary tube. Units and dimensions.

Sound.—Nature of sound waves. Determination of velocity of sound. Its connection with the elasticity and density of the medium. Reflection and refraction of sound. Lissajou's Figures Vibrations of strings and columns of air. Forced, free and maintained vibrations. Resonance. Methods of determining the frequency and wave length of notes. Interference of sound waves. Application of the equation $Y = a \cos \frac{2\pi}{\lambda} (vt - x)$ to problems of interference. Doppler's principle. Qualitative analysis of complex musical notes by Helmholtz resonators. Musical scales and Temperament. Recording and reproduction of sound.

Heat.—Theory of temperature measurement. Standard thermometer. Absolute temperature. Measurement of high and low temperatures. Calorimetry. Kinetic theory of gases. Deduction of simple gas laws. Perfect gas. Departure of actual gases from the perfect condition Experiments of Regnault, Andrew, Amagat and Joule. Youle-Thomson experiment. Critical temperature. Van der Waal's equation. Vapour pressure and its determination. Refrigeration. 1st and 2nd laws of thermodynamics. Determination of the mechanical equivalent of heat Indicator diagram, Carnot's ideal heat engine and its efficiency. Kelvin's absolute scale of temperature and its equivalence with the perfect gas scale. Entropy. Clapeyron's equation. Cycles of petrol and steam engines. Conductivities of solids and liquids and their determination. Comparison of the conductivities of gases.

Light.—Thin lenses and combination of lenses. Spherical aberration and methods of minimising it. Chromatic aberration. Achromatic combinations of lenses and prisms. Ramsden's and Huyghen's eyepieces. Telescopes and Microscopes. The eye and defects of vision. The spectrum. Wave theory of light, Huyghen's principle. Deduction of the laws of reflection and refraction and explanation of the rectilinear propagation of light. Interference. Newton's rings and colours of thin films. Michelson interferometer. Diffraction at a straight edge, narrow obstacle and narrow rectangular aperture. Diffraction grating. Resolving power of optical instruments. Polarisation and

double refraction (in uniaxial crystals). Circularly and elliptically polarised light. Rotation of the plane of polarisation. Polarimeter. Undulatory theory of light. Rectilinear propagation of light. Deduction of the laws of reflection and refraction. Interference of light. Newton's rings and colours of thin films. Michelson Interferometer. Diffraction. Diffraction grating. Resolving power of a lens and of a diffraction grating. Double refraction in uniaxial crystals. Plane, circularly and elliptically polarised light. Rotation of plane of polarisation. Use of polarimeter.

Magnetism.—Laws of Magnetic Force. Magnetic Potential. Potential and force due to a small magnet and a magnetic shell. Action of one magnet on another. Magnetic Induction.

Susceptibility and permeability. Hysterisis, Ferro-Para-and Dia-magnetism. Terrestrial Magnetism, Determination of H and dip.

Electricity.—Laws of electrostatic force and their experimental proof. Electric field. Gauss's Theorem, Potential and its calculation in simple cases. Condensers and calculation of capacities. Electrostatic Induction, Dielectric constant. Tubes of force and energy of the electrostatic Field. Quadrant and absolute electrometers. Frictional and Inductive machines. Electrostatic Units.

Primary, secondary and standard cells. Magnetic Fields due to electric currents. Electro-dynamics. Galvanometers. Ohm's Law. Krichoff's Laws. Properties of conjugate conductors. Measurement of Resistances. Potentiometer. Joule's Law. Thermo-electricity. Peltier and Thomson effects. Thermo-electric diagrams. Electro-magnetic Induction. Self and Mutual Inductances. Growth and decay of currents. Induction coil. Alternating currents. Impedence and Reactance. Power Factor. Choke Coil and Transformer. Electrolysis and Electrochemical Equivalents. Absolute and practical units and their dimensions. Elementary Theory of Dynamos and Motors, Electric Oscillations. Elementary principles of talking pictures. Generation and detection of electromagnetic waves and their relation to light. Three electrode valves. Characteristic curves. Simple receiving and transmitting sets. Discharge of electricity through

gases. Cathode rays, Positive rays, photo-electric effect, Determination of $\frac{e}{m}$ and charge of electrons. X-rays, Elements of Radio-activity, Isotopes.

EXPERIMENTS IN PRACTICAL.

(1) The Balance.
(2) Searle's method for Young's Modulus and Modulus of torsion.
(3) Young's Modulus by bending of a bar.
(4) Experimental determination of Moments of Inertia.
(5) Determination of Surface Tension by a Capillary tube.
(6) Modulus of Torsion—
  (*a*) Statical method.
  (*b*) Dynamical method.
(7) Sonometer.
(8) Weight Thermometer.
(9) Specific Heat by the method of Cooling.
(10) Constant Volume Air Thermometer.
(11) Constant Pressure Air Thermometer.
(12) Dew Point and Humidity.
(13) Determination of J. by Mechanical Method.
(14) Sextant.
(15) Index of refraction by Total Reflexion.
(16) Determination of Index of Refraction by the Spectrometer.
(17) Focal lengths of lenses.
(18) Magnifying power of Telescopes and Microscopes.
(19) Determination of Wave-length by a Diffraction Grating.
(20) Determination of H.
(21) Magnetic Maps of Straight and Circular Currents.
(22) Variation of the Magnetic Field due to a Circular Current along the Axis.
(23) Comparison of E. M. F.'s by the Tangent Galvanometer.
(24) Determination of Specific Resistances.
(25) Determination of the Resistance of a Galvanometer by Thomson's method.

(26) Determination of the internal resistance of a Cell by Mance's Method.
(27) Resistance of Accumulators.
(28) Potentiometer.
(29) Determination of J. by the Electrical Method.
(30) Reduction Factor of a Tangent Galvanometer.
(31) Determination of the Coefficient of Viscosity of a liquid.

And *any five* of the following :—

(1) Surface Tension either by Jager's method or by the detachment of a plate.
(2) λ by Clement and Desorme's method.
(3) Conductivity of a metal.
(4) Kundt's tube.
(5) Melde's Experiment.
(6) Photometry.
(7) λ by Biprism or Lloyd's mirror.
(8) λ by Newton's rings.
(9) Determination of the strength of Sugar solutions by a Polarimeter.
(10) Comparison of Capacities.
(11) Dip by Earth Inductor.
(12) Carey Foster's Bridge
(13) Platinum Resistance Thermometer.
(14) Characteristic Curve of a Triode Valve.

CHEMISTRY.

The examination in Chemistry will comprise *two* papers and a practical examination. Candidates must obtain minimum pass marks in the practical examination as well as in the total of the theory papers.

The course prescribed for the Intermediate Examination together with the following :—

Physical and Inorganic.—Atomic theory. Avogadro's hypothesis and its application. Determination of equivalents. Specific heats of elements and compounds. Isomorphism. The periodic classification of elements. Methods of determining atomic and molecular weights. Kinetic theory of gases. Law of mass action and its applications. Ionic theory of solutions. Osmotic pressure, vapour pressure, influence of solutes on freezing and boiling points. Laws of electrolysis, electro-chemical

equivalents, determination of conductivity and transport numbers. Avidity of acids and bases. Hydrogen ion concentration and theory of indicators. Elements of catalysis, colloids, spectrum analysis, thermo-chemistry, atmoic structure, atomic numbers, radio-activity, and isotopes. The relation of physical properties to chemical constitution. Elements of Phase Rule.

The occurrence. preparation and properties of the following elements and their important compounds, treated especially with regard to the periodic classification. Outlines of the main metallurgical processes of the metals indicated by an asterisk—Hydrogen, Argon, Helium, Li, *Na, *K, *Cu, *Ag *Au, Mg. Ca, Sr, Ba, Ra, *Zn, Cd, *Hg, B, *Al, C, Si, Sn, *Pb, N, P, As, Sb, Bi, O, S, Cr, F, Br, Cl, I, Mn, *Fe, Co, *Ni, and *Pt. Principal chemical manures. Outline of the nitrogen cycle.

Practical.—Qualitative analysis of mixtures of substances containing not more than four of the following radicals, positive or negative, by dry and wet methods:—

NH_4, Na, K, Mg, Ca, Sr, Ba, Zn, Mn, Ni, Co, Al, Cr, Fe, Cu, Bi, Hg, Cd, As, Sb, Sn, Pb, Ag, Co_3, S, SO_3, SO_4, F, Cl, Br, I, NO_2, NO_3, ClO_3, also borate, acetate, oxalate, phosphate.

Acidimetry and alkalimetry, iodometry (using thiosulphate, arsenite, permanganate and dichromate). Titration of iron with potassium permanganate and dichromate, standardization of permanganate by oxalic acid. The volumetric determination of silver as chloride and as thiocyanate.

Gravimetric estimation of Ba, Cu, Ag, Pb, Zn, Fe, chloride and sulphate.

Organic.—The rise, the development and the characteristics of organic chemistry. Methods of purification and tests of purity of organic substances. Methods of ultimate analysis, qualitative and quantitative. Determinations of empirical formula and molecular weights. Structural formula Homology and Isomerism. The occurence, the preparation, the properties and the structure of the following:

Acyclic hydrocarbons, saturated (up to pentane) and unsaturated (the first members) The petroleum industry. Halogen derivatives, mono-, di-, tri-, tetra-, etc.

Alcohols saturated (the first four), industrial alcohol. Fermentation, and elementary knowledge of enzymes, yeast, bacteria and moulds. Glycol, glycerol and their derivatives. Manufacture of glycerol and its nitrates.

Ethers Aldehydes and ketones.

Monobasic fatty acids saturated (up to butyric). Vinegar, soaps, candles, their manufactures, oils and fats Acid halides, anhydrides, amides and esters.

Mercaptans.

Amines, nitro-paraffins. Cyanogen and derivatives. Urea.

Organo-metallic compounds of zinc and magnesium.

Haloid acids, cyanacetic acid, amino-acids. Hydroxy-monobasic acids (glycolic and lactic). Optical isomerism. Ketonic acids (aceto-acetic). Tautomerism.

Dibasic acids (carbonic, oxalic, malonic and succinic) and derivatives. Acids: malic, tartaric and citric.

Glucose, fructose, sucrose, starch and cellulose (only a general view of occurrence, properties and reactions) Manufactures of sugar, paper and cellulose derivatives.

Proteins, their occurrence and general characteristics in an elementary way.

Cyclic aromatic hydrocarbons, benzene, toluene and naphthalene. Coal gas and coal tar distillation. Characteristics of aromatic compounds. The following derivatives of the above three, the halogen, the nitro-, the amino- and the sulphonates. The diazo-reaction.

Phenol, catechol, resorcinol, pyrogallol, quinol, and the naphthols. Benzyl alcohol, benzaldehyde, acetophenone, benzophenone, quinone, benzoic acid, benzoyl chloride. Salicylic and pthallic acids. Pyridine.

Practical.—

Systematic identification of the following organic compounds, including (1) the determinations of their boiling or melting-points, (2) the detection of the elements contained, (3) the application of tests characteristic of the groups contained and of the compounds themselves, and (4) wherever possible, the preparation of a derivative in a pure condition :—

Benzene, naphthalene, methanol, ethanol, glycerol, phenol, formaldehyde, benzaldehyde, acetone, pyrogallol, acids formic, acetic, oxalic, tartaric, citric, benzoic and salicylic, ethyl acetate, glucose, sucrose and starch, chloroform, iodoform, urea, aniline, chlorobenzene, chloronaphthalene, paradichlorobenzene, chloral hydrate, acetamide, acetanilide, nitrobenzene, toluene, resorcinol and ethyl benzoate.

Books recommended—

CAVEN : Foundations of Chemical Theory.
WALKER : Introduction to Physical Chemistry.
CAVEN AND LANDER : Systematic Inorganic Chemistry.
SMITH AND KENDALL : Introduction to Inorganic Chemistry.
PARTINGTON : Text-book of Inorganic Chemistry.
MELLOR : Modern Inorganic Chemistry.
COHEN : Theoretical Organic Chemistry.
PERKIN AND KIPPING : Organic Chemistry.
OSTWALD : Foundations of Analytical Chemistry.
CAVEN : Qualitative Analysis.
MOLLOW PERKIN : Qualitative Analysis.
WATERS : Introduction to Practical Organic Chemistry (Edward Arnold & Co.)
CAVEN : Quantitative Chemical Analysis ; Part I (Blackie).

ZOOLOGY.

The examination will comprise *two* papers and a *practical* examination. Candidates must obtain the minimum pass marks in the practical examination as well as in the total of the theory papers.

The following Syllabus is prescribed :—

The general principles of Biology treated in an elementary manner, comprising the theory of evolution with the general notions of variation, heredity, and adaptation.

The elementary principles of the geological and geographical distribution of animals.

The structure and the phenomena of the animal cell.

Reproduction, sexual and asexual ; Parthenogenesis ; Metamorphosis ; Alternation of generations.

The structure, habits, developments and the economic importance (if any) of the non-chordata as illustrated by—

Protozoa .. Amœba, Paramœcium, Euglena, and Malarial parasite.
Porifera .. Sycon or any other sponge.
Cœlenterata .. Hydra, Obelia.
Platyhelminthes Liverfluke and Taenia.
Annulata .. Pheretima, Nereis and Leech.
Echinodermata Starfish (general characters and external features only)
Arthropoda .. Prawn, Locust (if not available, Cockroach), Anopheles, Housefly, and Scorpion. Cimex (bed bug); habits, habitat and external features.
Mollusca .. A fresh-water Mussel, and Pila or any other Pond Snail.

The principal characteristics, structure and habits of the Chordata as illustrated by—

Acrania—

Hemichorda .. Balanoglossus
Urochorda .. Herdmania or any other ascidian.
Cephalochorda Amphioxus.

Craniata—

Pisces .. Scoliodon or any other Elasmobranch and external features of a bony fish (skeleton excluded).
Amphibia .. The Frog.
Reptilia .. Hemidactylus or any other lizard.
Aves . Columba (The skeleton of Gallus may be substituted)
Mammalia .. The general characters of the Prototheria and Metatheria; Lepus, Squirrel or Rat; Canis (skull only).

The outlines of the development of Ciona, Amphioxus; frog, chick, and rabbit. Amnion and Allantois. Placentation.

The elementary physiology of the various organs of the animal body, as illustrated by the Frog and Rabbit.

Paper I—shall comprise the non-chordata, the structure of the animal cell, the subjects of Repro-

duction and Histology and the general principles of Biology.

Paper II—The Chordata, Vertebrate Embryology, Physiology, Geological and Geographical distribution.

PRACTICAL COURSE.

Candidates will be required to show a knowledge of simple microscopic technique and to dissect and describe the following animals :—

Amœba, Paramœcium, Sycon, Hydra, Obelia, Pheretima, Nereis, Leech, Starfish (external features only), Prawn, Cockroach, Scorpion, Unio, Pila, Balanoglossus (external features only), Herdmania, Amphioxus (dissection omitted), Scoliodon, or any other Elasmobranch, Frog, Lizard, Pigeon, and Rabbit, Squirrel or Rat.

Osteology of dogfish, frog, lizard, fowl, rabbit, dog's skull, and Echidna (limbs and limb girdles only).

Note-books containing a complete record of laboratory work must be produced at the practical examination.

Books recommended—

PARKER AND HASWELL: Text-book of Zoology (Macmillan), Vols. I and II.

WIEDERSHEIM AND PARKER: Comparative Anatomy of Vertebrates.

BOURNE: Comparative Anatomy of Animals, Vols I and II.

PARKER AND BHATIA: Text-book of Zoology for Indian Students.

DENDY: Outlines of Evolutionary Biology.

MARSHALL AND HURST: Practical Zoology (John Murray).

THOMSON: Outlines of Zoology.

KINGSLEY: Comparative Anatomy of Vertebrates.

K. N. BAHL: Pheretima

E. M. THILLAYAMPALAM: Scoliodon.

BAINI PRASAD: Pila.

BORRADAILE AND POTTS: Invertebrata.

S. M. DAS: Hardmania.

Br. Mus. Nat. Hist. Economic Series No. 5—The Bed Bug.

BOTANY.

The examination will comprise *two* papers and a *practical* examination. Candidates must obtain minimum pass marks in the practical examination as well as pass in the total of the theory papers.

The following syllabus is prescribed—

1. The anatomy (including histology) of the vegetative and reproductive organs of Phanerogams and Cryptogams treated from the comparative and functional standpoints.

A general knowledge of the plant-cell and plant tissues. The cell contents and their micro-chemical reactions.

2. The morphology, physiology, and life-histories of:

Thallophyta—

(*a*) Bacteria.

(*b*) Algæ .. Oscillatoria, Nostoc, Pleurococcus, Ulothrix, Oedogonium, Vaucheria, Chara, Fucus, and Polysiphonia.

(*c*) Fungi ... Rhizopus, Cystopus, Saccharomyces, Morchella, Eurotium, Ustilago, Puccinia and Agaricus

Bryophyta—

(*a*) Hepaticæ .. Riccia, Marchantia and Anthoceros.

(*b*) Musci ... Funaria or any other moss

Pteridophyta—

(*a*) Filicinæ .. Equisetum, Aspidium or other fern, Marsilia.

(*b*) Lycopodinæ Selaginella.

Spermaphyta—

(*a*) Gymnosperms..Cycas and Pinus.

(*b*) Angiosperms ..A detailed knowledge of the structure and life-history of a typical flowering plant and the characteristic features and economic importance of the following families :—

Gramineæ, Palmæ, Liliaceæ, Musaceæ, Orchidaceæ, Caryophyllaceæ, Ranunculaceæ, Papaveraceæ, Capparidaceæ, Cruciferæ, Rosaceæ, Legumi-

nosæ, Rutaceæ, Euphorbiaceæ, Malvaceæ, Myrtaceæ, Umbelliferæ, Asclepiadaceæ, Convolvulaceæ, Labiatæ, Solanaceæ, Acanthaceæ, Apocyanaceæ, Rubiaceæ, and Compositæ.

3. Vegetable Physiology—
   (*a*) An elementary knowledge of plant anatomy from the physiological standpoint.
   (*b*) Nutrition—Chemical constituents of the plant; the essential constituents of plant food; the absorption of water and dissolved substances; water conduction; transpiration; Assimilation of Carbon and Nitrogen; the utilization and transference of the products of assimilation and reserve materials; special processes of nutrition.
   (*c*) Respiration—General facts.
   (*d*) Growth—General facts; the effect of external conditions on growth.
   (*e*) Movements—Protoplasmic movements; imbibition movements; heliotropism; geotropism; contact stimuli and their effects; movements of variation.
   (*f*) Reproduction—Vegetative reproduction; sexual reproduction, including double fertilization; cross and self-pollination; dispersal of fruits and seeds; germination.

4. An elementary knowledge of variation, heredity, evolution and plant-breeding.

5. Elementary plant ecology.

Paper I—shall comprise the Morphology, Physiology and life-histories of Cryptogams and Gymnosperms.

Paper II—shall comprise the Morphology, Physiology, and life-histories of Angiosperms General Plant Physiology, General Biology and Ecology.

PRACTICAL COURSE.

The dissection of plants and parts of plants. The preparation, staining and study of microscopical sections of plants and the principal varieties of plant tissues The uses of stains and other re-agents, and the micro-chemical reactions of protoplasm, starch, and cellulose with its derivatives.

A practical study of the typical plants enumerated under section 2; the referring of plants and parts of plants to their appropriate position in the given schedule of classification.

The description of plants and parts of plants in technical language.

Simple experiments in Plant Physiology.

Note-books containing a complete record of laboratory work must be produced at the *practical* examination.

Books recommended—

SCOTT: Structural Botany, Vols. I and II.
STRASBURGER: Text-book of Botany.
STRASBURGER AND HILLHOUSE; Practical Botany.
COULTER, BARNES AND COWLES: Text-book of Botany.
WILLIS: Flowering Plants and Ferns.
CAVERS: Practical Botany.
PALLADIN: Plant Physiology.
BRIMBLE: Every-day Botany.
HOLMANS AND ROBBINS: Text-book of General Botany.
GAGER: General Botany.

MILITARY SCIENCE.

There will be *two* papers and a *practical* test:—

Paper I.—Military Organisation, administration, and tactics.

This will include—

(1) Principles of war, with historical illustrations, and their application to operations in the field with special reference to Infantry, *i. e*, Protection (Advance guards, Rear guards, and outposts); Attack and Defence.
(2) Characteristics of Fighting Troops, Cavalry, Infantry, Artillery, Aircraft, Tanks and Armoured Cars.
(3) Organisation of fighting troops.
(4) Information, reconnaissance from the air and on the ground.
(5) Composition and transmission of orders (operation orders, reports and messages), means of communication in the field.
(6) Field works—cover, obstacles, trenches, water-supply and sanitation.

Reference books :—

Field Service regulations, Vols. 1 and 2 (Govt. publication).

Infantry Training, Vol. 2 (Govt. publication)

Manual of Field Works (Govt. publication).

Manual of Military Hygiene (Govt. publication).

Historical Illustrations to F. S. R.

PAKENHAM WALSH : Elementary Tactics.

MARSHALL FOCH : Principles of War.

Manual of Map-reading and Field-sketching (Govt. publication).

PENDLEBERY : Tactics.

Paper II.—Military Law (Indian).

This will include—

(1) Indian Army Act.

(2) Arrest and investigation of charges.

(3) Court-martial.

(4) Evidence.

(5) Civil offences.

(6) Duties in aid of the Civil Power.

(7) I. T. F. Act.

Reference Books—

Manual of the Indian Military Law (Govt. publication).

O'Donnell : Manual of Indian Military Law (abridged).

PRACTICAL WORK.

The candidates will be required to pass a practical test in (*a*) map-reading, (*b*) field-sketching and (c) elementary tactical exercises (platoon).

ENGLISH.

(*Same as B. A.*—General English)

M. Sc. EXAMINATION.

MATHEMATICS.

PREVIOUS.

(For the Examination of 1942.)

Paper I.—(*i*) *Algebra.*—Sequence and limits, convergence of infinite series and of infinite products, the expansion of Sine and Cosine in an infinite product.

Books recommended—
HOBSON: Plane Trigonometry.
BERNARD AND CHILD: Higher Algebra.

(*ii*) *Theory of Equations.*—General properties of equations, relations between roots and coefficients, symmetric functions of the roots, transformation of equations, algebraic solutions of the cubics and biquadratics, sums of powers of roots, Sturm's theorem, approximate solutions of numerical equations, determinants.

(*iii*) *Vector Analysis.*—Fundamental notions, addition, subtraction and multiplication of Vectors, simple geometrical and mechanical applications.

Book recommended—
WEATHERBURN: Elementary Vector Analysis.

Paper II.—(*i*) *Differential Calculus.*—Theorem of mean value; Taylor's theorem; maxima and minima of functions of two or more variables; definitions of continuity and differentiability; change of variables; Jacobians.

(*ii*) *Integral Calculus.*—Improper integrals and simple tests for convergence of integrals; definite integrals including Beta and Gamma functions; multiple integrals; volumes and surfaces of solids; use of Fourier's series.

(*iii*) *Differential Equations.*—Ordinary equations of the first order; general linear equations with constant co-efficients; linear equations

of the second order, including transformations to standard forms and variation of parameters ; homogeneous equations and exact equations ; simultaneous differential equations with constant co-efficients : total differential equations ; partial differential equations of the first order.

Paper III.—(*i*) *Analytical Geometry of three dimensions.*—Plane, straight line, reduction of the general quadratic equation to standard forms, properties of a quadric surface referred to its principal axes.

(*ii*) *Analytical Geometry of two dimensions.*—Homogeneous co-ordinates, tangential co-ordinates, families of conics, invariants and co-variants.

Paper IV —(*i*) *Analytical Statics.*—Strings in two dimensions ; centres of gravity ; virtual work, stability, systems of forces in two or three dimensions.

(*ii*) *Dynamics of a particle in two dimensions.*—Central forces, motion in a resisting medium, constrained motion, hodographs and revolving curves.

FINAL.

(For the Examination of 1943.)

The examination shall consist of four papers as follows :—

COMPULSORY.

Paper I.—(*i*) *Theory of Aggregates.*—Cantor's and Dedekind's theory of irrational numbers ; arithmetical theory of limits ; linear sets ; limiting points and derivatives of point sets ; descriptive terminology of point sets ; enumerable aggregates ; power and content of an aggregate ; definition of measure.

(*ii*) *Theory of Functions of a real Variable.*—Continuity and discontinuity of functions of a single variable, properities of continuous functions, Maxima and minima of a continuous function, derivatives of func-

tions, Mean Value theorem, Riemann's integration, Fundamental theorem of the integral calculus Mean value theorems in integral calculus, the continuity of the sum function of an uniformly convergent series, differentiation and integration of series.

(*iii*) *Theory of Functions of a Complex Variable.*—Conformal representation of one plane on another ; integration of a regular function ; Cauchy's theorem, residues ; development in power series ; Taylor's and Maclaurin's series and Laurant's series.

(*iv*) Uniform convergence of series, products and integrals, including the continuity of some function and term by term differentiation and integration of series.

Paper II.—(*i*) *Statics* —Attractions and potentials of rods, discs and spheres ; Gauss's, Laplace's and Poison's theorems.

(*ii*) *Rigid Dynamics* in two and three dimensions.—Moments and products of Inertia, Principal axes, Momental Ellipsoid and definition of ellipsoid of gyration. D. Alembert's principle. Motion about a fixed axis, centre of percussion. Motion in two dimensions. Principles of momentum and energy. Lagrange's equations in generalised co-ordinates. Euler's Dynamical and Geometrical equations.

Papers III and IV.—*Any two* of the following :—

(*i*) Spherical Harmonics.—Linear partial differential equations with constant co-efficients, Monge's methods, solution in series of Legendre's, Bessel's equations and hypergeometric series, solutions of Laplace's equations in spherical, cylindrical and ellipsoidal co-ordinates, expansion of a function to surface harmonics, application to potential problems.

Books recommended—

MACROBERT : Spherical Harmonics.

GANESH PRASAD : Spherical Harmonics, Part I.

(*ii*)—Hydromechanics.

Hydrostatics.—Laws of fluid pressure ; general conditions of equilibrium in a fluid ; uniformly rotating liquid ; equilibrium of floating bodies, including metacentric formulæ, equilibrium of gaseous liquids (excluding capillarity and oscillation of floating bodies).

Hydrodynamics.—Lagrangian and Eulerian methods, continuity, bounding surface condition, velocity, potential and current function, sources and sinks, motion of circular and elliptic cylinders in two dimensions, motion of a sphere in a liquid, simple waves, vibrations of a string and of air in tubes.

Book recommended—

BESANT and RAMSAY : Hydro-mechanics, Parts I and II.

(*iii*)—Elliptic Functions and Vector Analysis.

Elliptic Functions—General properties of elliptic functions ; Weierstrassian and Jacobian elliptic functions, including the Sigma and Zeta functions ; elliptic integrals ; simple geometric and mechanical applications.

Books recommended—

GOURSAT : Mathematical Analysis.

HANCOCK : Elliptic Functions.

Vector Analysis.—The Scalar and Vector products of Vectors ; gradient of a scalar function and the curl and divergence of Vector functions. The line, space and volume integrals of Vector functions with the standard transformation formulæ. The linear Vector functions. Simple applications to differential geometry, attraction and potential.

Book recommended—

WEATHERBURN : Advanced Vector Analysis.

(*iv*) Spherical Trigonometry and Spherical Astronomy

Spherical Trigonometry, including the general properties of Spherical triangles.

Spherical Astronomy—Fundamental Instruments ; Celestial sphere ; Atmospheric refraction ; Precession and Nutation ; Time ; The Ecliptic ; The Equation of Time ; Aberration ; Parallax ; Eclipses ; Rising of the

Sun and the Moon; Twilight; Determination of position on earth; Planetary Phenomena.

Books recommended—

SMART: Astronomy.

BALL: Spherical Astronomy.

TUDHUNTER AND LEATHEM: Spherical Trigonometry.

(*v*)—Solid and Differential Geometry.

Systems of quadrics, surfaces and curves in space, including the associated developables and Frenet's formulæ, fundamental forms, Gauss's characteristic equation and the Mainardi-Codazzi relations, lines of curvature, conjugate lines, asymptotic lines, geodesics and geodesic curvature.

Books recommended—

BELL: Solid Geometry.

FORSYTH: Differential Geometry (First three chapters).

EISENHART: Differential Geometry.

(*vi*)—Complex Variable.

1. Meromorphic functions; Rouche's, Hurwitz's, Jensen's, Carleman's and Littlewood's Theorems; Poisson-Jensen Formula.

2 Analytic continuation; simple properties of Gamma and Zeta functions. Hadamard's multiplication Theorem.

3. The maximum-modulus Theorem: Vitali's and Montel's Theorems. Hadamard's Three circles Theorem. Caratheodory's inequality, the theorems of Phragmen and Lindelof.

4. Conformal representation and simple functions.

5. Power series with a finite radius of convergence: Riesz-Fatou Theorem; Over-convergence; Hadamard's gap Theorem; Hardy-Littlewood's Theorem; Abel's Theorem and its converse; Partial Sums of Power series.

6. Integral functions: Weierstrass's and Hadamard's Theorems; Sterling's Theorem; Theorems of Laguerre; Borel's, Schottky's, Landau's and Picard's Theorems.

7. Dirichlet's Series: Simple properties of ordinary Dirichlet's Series.

Book recommended—

E. C. TITCHMARSH : The Theory of Functions (O.U.P.); 1932—Chapters III-IX.

(vii)—Mathematical Theory of Statistics.

General nature and scope of Statistical methods. Classification of Statistical data by categories and measurements. Frequency Distributions.

Measures of Central tendency ; Mean, Median and Modi.

Measures of Dispersion—Standard Deviation.

Elements of the theory of probability. Addition and Multiplication Theorms. Mathematical Expectation.

Normal, Binomial and Poisson Distributions. Moments. Elementary ideas of skew distributions.

General ideas of association and correlation. Co-efficient of correlation.

Elements of Sampling Theory. Exact distribution of x^2,t, and z—statistics in samples drawn from a normal population, with application to the problem of the significance of the difference of the means based on large and small samples.

PHYSICS.

(For the Previous and Final Examinations of 1943)

The following is the detailed syllabus (in addition to what is included in the B. Sc. course) :—

Paper I.—*Heat.* Measurement of high and low temperatures. Absolute Temperature and correction of gas thermometers. Kinetic Theory of Matter. Molecular dimensions. Andrew's Experiments. Equation of state. Change of state and liquefaction of gases. Conductivity and its absolute determination.

Thermodynamics and heat-engines. Radiation. Application of Thermodynamics to Radiation. Quantum Theory of Radiation. Debye's Theory of specific heats. Nernst's Heat Theorem.

Paper II.—*General Properties of Matter.* Theory of compound Pendulums. Determination of Gravitation constant. Simple Theory of Elasticity. Theory of surface tension. Elementary Theory of waves and ripples. Visco-

sity of liquids and gases. Compression and dilatation of liquids. Diffusion. Modern Air-Pumps.

Sound.—Vibrations and waves. Plane and spherical waves of sound. Elementary theory of vibration of strings, bars, plates, membranes and pipes. Fourier's Theorem and its applications to vibrations of strings. Forced vibrations and resonance. Simple theory of resonators. Combinational Tones. Maintenance of vibrations. Theory of singing flames. Concord and discord. Musical Scales. Theory of Vowel sounds.

Paper III. *Electricity and Magnetism.* General Theory of Magnetic, Electric and Electro-magnetic fields. Electro-magnetic Induction Alternating currents. Electrical and Magnetic measurements. D. C. and A. C. measuring instruments, Dynamos, Alternators, Motors, Transformers and Accumulators, Electrolysis. Thermo-electricity. Electric Oscillations, Maxwell's Equations and Electro-magnetic waves. Wireless Telegraphy and Telephony.

Paper IV.—*Electron Theory.* Conduction of electricity through gases. Ionisation currents. Mobility and diffusion of ions. Ionisation Potentials. Cathode. rays Determination of e/m and of the electronic charge. Photo-electricity. Thermionics. The nuclear theory of the atom. Determination of the nuclear charge and the number of electrons in the atom. Positive ray analysis and mass spectrograph. Production, reflection, refraction, and diffraction of X-rays. Measurement of wave-lengths of X-ray and X-ray spectrographs, X-ray spectra. Radio-activity and Radio-active Transformations Dynamics of the Electron.

Variation of the mass of the electron with velocity. Radiation from accelerated Electrons. Electrical Theory of Matter, Magnetons.

Paper V.—*Light, including elements of Spectroscopy.* Theory of image formation. Cardinal points. Spherical and chromatic aberrations Aplanatic points Theory of Diffraction. Concave and Echelon gratings. Interferometers. Lummer plates. Theory of double refraction. Interference of Polarised light. Spectroscopy of infra-red and ultra-violet. Elements of the electro-magnetic theory

of light and its application to reflection, refraction, dispersion and absorption. Magneto and Electro-optics. Series spectra. Elementary knowledge of Bohr's Theory of atomic spectra. Propagation of light in moving media and special theory of Relativity.

Paper VI.—*One* of the following subjects :—

(*a*) *Meteorology.*

Theoretical—Thermodynamical properties of gases; determination of heights from pressures and temperatures at different levels.

Isothermal, convective, and radiative equilibrium of the atmosphere. Comparison with actual conditions existing in different parts of the world.

Buys Ballot's Law; cyclonic and anti-cyclonic motions, influence of change of temperature-gradient with height on change of wind with height.

Turbulence—Taylor's eddy conductivity and eddy viscosity. Wind in the lower layers of the atmosphere.

Thermodynamics of moist air, Neuhoff's diagram and T-fi diagram. Radiation—solar and terrestrial.

General ideas about waves and disturbances in superposed layers of air with horizontal and inclined surfaces of separation.

Meteorological Optics; Blue of the sky. Twilight colours Halos. Coronas Rainbows.

General circulation of the atmosphere; trades and antitrades; monsoons, cyclones of the subtropical and tropical seas

(*b*) *Spectroscopy.*

Various methods of producing spectra; prism spectroscopes of various types; concave grating; echelon grating; Lummer plates. Littrow spectrographs, vacuum grating spectrographs Infra-red spectrometer. Photography of infra-red and ultra-violet spectra. Determination of wavelengths by interference methods. Band spectra; series spectra, series formulæ and notations Relation of atomic constants and series spectra; general principles of quantum theory of line spectra; Bohr's theory; Resonance and ionisation potentials Energy diagrams; Correspondence principle. Kossell and Sommerfeld's Displacement Law. Emission and absorption spectra of elements; Stark effect,

Zeeman effect. Fine structure of lines ; thermal excitation ; Rais ultimes. Laws of emission and absorption ; Continuous spectra from black bodies and other substances. Application of spectroscopy to astrophysics. Theories of dispersion and absorption.

(c) X-rays.

Phenomena in vacuum tubes ; generation of X-rays, high voltage generators ; X-ray bulbs : different methods of setting up an X-ray establishment.

Study of properties of X-rays, secondary X-rays, characteristic X-rays, absorption co-efficient of characteristic X-rays, ionisation by X-rays, scattering of X-rays.

Laue's discovery of the diffraction of X-rays by crystals, Bragg's method of reflection ; crystal analysis by Bragg's method of reflection ; crystal analysis by the Debye-Scherrer method and the Laue method ; X-ray spectrometers ; Moseley's work on the measurement of wavelengths of characteristic X-rays. Siegbahn's work ; X-ray absorption spectra.

(d) Wireless Telegraphy and Telephony.

Historical introduction.

Generation, reflection, refraction, polarisation and propagation of Hertzian waves, oscillatory discharge, generation of short waves, and their identity with dark heat rays. Early methods of wireless telegraphy Radiation to long distances ; reception.

Radio-frequency measurements of capacity, resistance, self and mutual inductance, and current. Coupling. Measurement of wave-length ; wave-meters.

Various types of antennæ ; theory of radiation from antennæ.

Thermionic valves, theory and uses.

Theory of thermionic currents ; characteristic curves of valves ; the triode valve as detector, amplifier, and generator of waves. Principles of regeneration Multistage amplification for high and low frequency

Telephony :—

Different kinds of microphones : modulation, loudspeakers.

Transmitting circuits : receiving circuits ; heterodyne reception

Propagation ; atmospherics and day-light effect.
Uses—broadcasting meteorological.

Practical.

The scope of work is approximately indicated by the following :—

I. Heat.

1. Steam Calorimeter.
2. Conductivity.
3. Platinum Thermometer
4. Thermo-couple.
5. Determination of J.
6. Determination of Stefen's Constant.

II. General Properties of Matter and Sound.

1. Kater's Pendulum.
2. Viscosity of Liquids and Gases.
3. Variation of Surface Tension with Temperature.
4. Stroboscopic Determination of Frequency.
5. Kundt's Tube.

III. Electricity and Magnetism.

1. Standardisation of Ballistic Galvanometer.
2. Self and Mutual Induction.
3. Capacity of condensers.
4. Hysterisis.
5. Potentiometer.
6. Carey Foster's Bridge.
7. Kelvin Bridge.
8 A. C. Measurements.
9. Wireless receiving sets.

IV. Electron Theory.

1. Quadrant Electrometer.
2. Cathode-ray Oscillograph.
3. Measurement of e/m.
4. Measurement of charge of an electron.
5. Measurement of Photo-electric currents and of 'h.'
6. Ionisation by Alpha-ray tracks.
7. Diffraction of X-rays.

V. Light.

1. Adjustment and Calibration of Spectrometer.
2. Constant Deviation Spectrometer.

3. Biprism.
4. Michelson Interferometer.
5. Fabry and Perot Interferometer.
6. Elliptically and Circularly polarised light.
7. Verification af Fresnel's formulæ of reflection and refraction of light.

VI. (*a*) *Meteorology.*

1. Different types of clouds, General physical processes involved in their formation. Nephoscopes and their use for measuring wind direction and velocity.
2. Practical knowledge of self-recording instruments of a first class meteorological observatory.
3. Pilot balloons, following and working out single theodolite, double theodolite and flag methods.
4. Sounding balloons, meteorographs. Calibration, working out of records and interpretation.

(*b*) *Spectroscopy*

1. Arc and Spark spectra.
2. Quartz spectrograph.
3. Concave Grating
4. Determination of Wave-lengths—Hartmann Formula.
5. Lummer Gehrcke Plate.
6. Zeeman effect.
7. Spectrophotometer.
8. X-ray Spectrograph.

(*c*) *X-rays.*

1. Practice with X-ray tubes.
2. Bragg's reflection method of X-ray analysis—(The wave-length, crystal constants and determining the structure of crystals).
3. Practice with the X-ray Spectrometer : wave-length of characteristic lines.
4. Absorption and scattering of X-rays.
5. Ionisation by X-rays.

(*d*) *Wireless Telegraphy and Telephony.*

1. High frequency measurement of capacity ; self and mutual inductance ; resistance.

2. Measurement of wave-length.
3. Characteristic curves of triode valves.
4. Practice with different detectors.
5. Crystal detectors and valve detectors.
6. Practice with transmitting sets.
7. Practice with amplifying sets.

CHEMISTRY.

PREVIOUS.

(For the Examination of 1942.)

NOTE.—Candidates will be required to pass in the written as well as in the practical examination separately

There will be *three* papers as follows :—

Paper I—Inorganic.

Paper II.—Organic.

Paper III—Physical.

In each paper questions will be set on History.

Inorganic.—The elements specified for the B. Sc. course in more detail, including their modes of occurrence and chief metallurgical processes. A general knowledge of the less common inorganic compounds and of important rare elements.

Standard analytical methods outside the B. Sc. course. Gas analysis. The use of Lunge's Nitrometer.

Organic.—The B. Sc. course extended so as to include the simpler synthetic dyes, non-benzenoid rings, natural bases, terpenes, sugars, organo-metallic compounds, other compounds containing sulphur. Enzymes and examples of their industrial use, the chemistry of carbon assimilation (the whole treated in an elementary and representative manner). The theories of geometrical isomerism, optical activity, steric hindrance.

Preparation and systematic detection of organic compounds. Ultimate (or "elementary") analysis.

Physical.—The B Sc course extended so as to include the theory and practical methods of determination of vapour density, osmotic pressure, molecular weight, heat of reaction, velocity of reaction, strength of acids. Electrochemistry of solutions. Electro-analysis, spectroscopy, and

photo-chemistry. The phase rule, equilibrium, the periodic law, surface phenomena. Elementary principles of thermodynamics, atomic structure and positive ray analysis.

Historical.—Outlines of chemical history from the time of Boyle.

FINAL.

(For the Examination of 1943.)

NOTE.—Candidates will be required to pass in the written as well as in the practical examination separately.

Students who have passed the Previous may present *any one* of the following branches of chemistry :—

(1) Inorganic, (2) Organic, (3) Physical, or (4) Applied.

Notice must be sent to the Registrar by the 15th August, of the branch which the student intends to present at the ensuing examination and, in the case of (4), the industry or manufacture to which he is attached.

A student, offering Inorganic, Organic, or Physical shall present a thesis dealing with original work done by him in his selected branch. The thesis, type-written and in duplicate, must reach the Registrar not later than one week before the date fixed for the written examination.

In each of these three branches, there will be *two* papers in addition to the thesis.

In branch (4) Applied Chemistry, the procedure for testing the fitness of a candidate will be decided as occasion arises.

Inorganic.—Recent discoveries, methods and theories, including an acquaintance with original papers. Reaction at high and low temperatures, examination of alloys and minerals and the practical use of the spectroscope. History of Inorganic Chemistry.

Organic.—Recent discoveries, methods and theories, including an acquaintance with original papers. History of Organic Chemistry.

Physical.—Recent discoveries, methods and theories, including an acquaintance with original papers. History of Physical Chemistry.

Applied.—The principle has been laid down that a candidate will be expected to show that he has *bona fide*

devoted himself to some important industry or manufacture and has acquired a reasonable degree of efficiency under all three of the following heads :—

(*i*) *Technical.*—He should have *either* (*a*) performed systematic analytical control, *or* (*b*) engaged in systematic research, *or* (*c*) introduced improved methods of mechanical handling, application or distribution of power, etc.

(*ii*) *Economic.*—He should have acquired some knowledge of sources and markets, of costing (including plant, power, labour control, distribution, depreciation, etc.) and of disposal or utilization of by-products and waste.

(*iii*) *Foreign.*—He should have studied the methods in use in other countries, as far as ascertainable by him.

ZOOLOGY.

PREVIOUS.

(For the Examination of 1942.)

A.—The structure, development, Bionomics, and Distribution in space and time of typical representatives and of other examples illustrative of general characters of the principal sub-divisions of each phylum of the Non-Chordata.

B.—The general principles of Biology, comprising the various theories of Evolution and the subjects of Variation, Heredity, Sex, Adaptation, etc.

The standard of examination is approximately indicated by the following text-books :—

PARKER AND HASWELL : Text-book of Zoology, latest edition, two volumes.

SEDGWICK : Text-book of Zoology.

The student is expected to consult other books of reference as well.

There will be *three* papers:—

Paper I will deal with the Comparative Anatomy and Embryology of Protozoa, Porifera, Coelenterata, Platyhelminthes, Nemathelminthes, Trochelminthes, Molluscoida and Echinodermata.

Paper II will deal with the Comparative Anatomy and Embryology of Annulata, Arthropoda and Mollusca.

Paper III will deal with the general principles of Biology, including the facts and theories of Evolution, and the subjects of Variation, Heredity, Adaptation, Selection, Isolation, Sex and Biometrics.

Candidates must produce at the practical examination their preparations and note-books containing a complete record of laboratory work.

FINAL.

(*For the Examination of 1943.*)

The subjects for examination shall be—

A.—The structure, Development, Bionomics and Distribution in space and time of typical representatives and of other examples, illustrative of general characters of the principal sub-divisions of the Chordata.

B.—A detailed knowledge of one of the two groups to be announced at least one year previous to the date of the examination. The groups selected until further notice are—

*(*a*) Fishes, and
(*b*) Reptiles.

*SPECIAL GROUP—FISHES.

1 Structure and development

2 Biology of Fishes

3 Classfication and Systematic Survey with special reference to Indian Fishes, including Marine, Brackish-water, Fresh-water and Hillstream Fishes

4 Origin and evolution of Fishes

5. Applied Ichthyology.

Methods of Fishing and Fisheries, including Fresh-water and estuarine fisheries, In-shore or coastal Fisheries.

[*Concluded on the next page*

C.—A thesis recording original work done by the candidate together with a review of recent literature on the problem investigated by him.

A candidate will be required to offer Papers I and II and either (*a*) or (*b*) or (*c*) of Paper III

Paper I will deal with the comparative Anatomy and Embryology of the Chordata.

Paper II will deal with the History of Biology, Zoogeography, Palaeontology and Economic Zoology.

Paper III (*a*) will deal with Fishes, with special reference to the fresh-water fishes of the U. P.

Paper III (*b*) will deal with Reptiles.

Paper III (*c*) Thesis.

PRACTICAL EXAMINATION.

A selected subject shall be studied as much as possible from the practical standpoint. A selected group shall be studied primarily from the local fauna available in the United Provinces and also from other examples of important types.

Candidates must produce at the practical examination their preparations and note-books containing a complete record of laboratory work which will be taken into consideration in determining the results of the examination.

Problem of Fishing Industries, Fluctuations, cyclic intensities, Migrations, Influence of Plankton.

Tinning and canning, Rail road transport and marketing, Economic survey of Fisheries

By-products of Fishing Industry, Fish oil, Fish manure, Isinglass, etc.

Maintenance and working of Aquaria, Hatcheries, Rearing and stocking ponds

Larvivorous Fishes and their utility.

In addition to books already suggested for the M Sc Examination, the following may be consulted —

NORMAN : History of Fishes.

ROULE , Journeys and Migrations of Fishes.

California Fisheries Bulletin.

Administration Reports of the Madras Fisheries Department.

Administration Report of the Punjab Fisheries Department.

Empire marketing Publications on Fisheries of the British Empire

Records and Memoirs of the Indian Museum.

BOTANY.

(*For the Previous and Final Examinations of 1943.*)

NOTE —Candidates will be required to pass in the written as well as the practical examination separately.

For the M. Sc. Examination in Botany, Previous and Final, there shall be the following five papers and thesis or Special paper as indicated below :—

Paper I. Thallophytes.
Paper II. Bryophytes and Pteridophytes.
Paper III. Gymnosperms, Cytology and General Biology.
Paper IV. Angiosperms.
Paper V. Physiology and Ecology.

Thesis or Special paper on *Study of Fungus pests of Crops in the United Provinces.*

Out of the five papers, candidates may take any three for the Previous examination, and the remaining two papers and the thesis or Special paper for the Final examination.

Two of the three papers set for the M. Sc. Examination shall be common for Previous and Final examinations every year.

1. The systematic morphology, physiology, and life-histories of the typical representatives of the principal groups of Thallopyhta, Bryophyta, Pteridophyta, Gymnosperms, and the Angiosperms.
2. A knowledge of the more important fossil types.
3. Physiological plant Anatomy and Ecology.
4. A knowledge of "Soil Bacteria" and "Soil Fungi."

   Candidates will also be expected to study the phenomena of Nutrition of Lichen Algae, Lichen Fungi, and reproduction of Lichens.
5. Plant Physiology
6. Study of Cytology including the following :— Protoplasm, Plastids, Somatic Mitosis, Meiosis, Fertilisation, Determination of Sex, Linkage. Cytological basis of Mendelism.
7. Fundamental facts of variation and heredity and the theories of evolution.

8. Principles of plant-breeding.
9. Special paper on *Study of Fungus Pests of Crops in the United Provinces.*

Or

Thesis recording original work done by the candidate and a brief review of recent literature on the problem investigated by him. Two typed copies of the thesis should be submitted a week before the examination.

Practical Examination.

The examination shall comprise the following :—

1. Detailed study of representative types of different groups prescribed in the syllabus.
2. Study of physiological plant anatomy.
3. Cytological study of suitable specimens.
4. Demonstration of important phenomena of plant life.
5. Referring of plants to their families or sub-families.
6. Detailed study of diseased crop plants and the technique connected with work on the life-histories of the parasites infecting them or a study of the larger aspects of the subject taken up by the student for his thesis.
7. *Viva voce* examination on subjects for the practical examination.

The following books are recommended :—

SMITH : Cryptogamic Botany, Vols. I and II.
EAMES : Morphology of vascular plants.

Thallophytes.

WEST AND FRITSCH : British Freshwater Algae.
WEST : Algae.
SMITH : Algae.
FRITSCH : The Structure and Reproduction of the Algae.
HARSHBERGER : Mycology and Plant Pathology.
GWYNNE-VAUGHAN : Fungi.
GWYNNE-VAUGHAN AND BARNES : Structure and Development of Fungi.
HEALD : Manual of Plant Diseases.
BROOKS : Plant Diseases.

FITZPATRICK : The Lower Fungi.
BUTLER : Fungi and Disease in Plants.

Bryophytes.
CAVERS : Inter-relationships of Bryophyta.
KASHYAP : West Himalayan Liverworts.
CAMPBELL : Mosses and Ferns.

Pteridophytes.
BOWER : Origin of a Land Flora.
BOWER : Ferns.
BEDDOME : Ferns of British India.

Gymnosperms.
COULTER AND CHAMBERLAIN : Morphology of Gymnosperms.
PEARSON : Gnetales.
CHAMBERLAIN : Living Cycads.

Fossil Botany.
SCOTT : Studies in Fossil Botany.
SCOTT : Extinct Plants and Problems of Evolution
SEWARD : Plant Life through the Ages.
SEWARD : Fossil Plants.

Angiosperms
COULTER AND CHAMBERLAIN : Morphology of Angiosperms.
EAMES AND MACDANIELLS : Introduction to Plant Anatomy.
JEFFREY : Anatomy of Woody Plants.
HABERLANDT : Physiological Plant Anatomy.
SOLEREDER : Systematic Anatomy of Dicotyledons.
WILLIS : Flowering Plants and Ferns.
ARBER : Monocots.
ARBER : Water Plants.
RENDLE : The Classification of Flowering Plants.
HUTCHINSON : Families of Flowering Plants.
SKENE : Biology of Flowering Plants.
DUTHIE : Flora of Upper Gangetic Plains.

Physiology.
PALLADIN : Plant Physiology.
RABER : Principles of Plant Physiology.
BARTON-WRIGHT : Recent Advances in Plant Physiology.
MILLER : Plant Physiology.

STILES : Photosynthesis.
STILES : Permeability.
SPOEHR : Photosynthesis.
DIXON : Ascent of sap.
DIXON : Transpiration Stream.
BOSE : Ascent of sap.
BOSE : Physiology of Photosynthesis.
DARWIN AND ACTON : Practical Plant Physiology.
DETMER AND MOORE : Practical Plant Physiology.
WHELDALE : Anthocyanin Pigments in Plants.

Ecology and Plant Distribution.

CAMPBELL : An Outline of Plant Geography.
SCHIMPER : Plant Geography.
WARMING : Ecology of Plants.
TANSLEY AND CHIPP : Aims and Methods in the Study of Vegetation.
WEAVER AND CLEMENTS : Plant Ecology.

Cytology and Microtechnique

SHARP : Cytology.
WILSON : Cell in Development and Heredity.
CHAMBERLAIN : Methods in Plant Histology.
LEE : Vade Mecum.
COWDRY : General Cytology.
DARLINGTON : Recent Advances in Cytology.

General Biology.

HALDANE : Causes of Evolution.
LOUK : Heredity, Variation and Evolution.
BATESON : Mendelism.
COULTER : Outline of Genetics.
BABCOCK AND CLAUSEN : Genetics in relation to Agriculture.
SANSOME AND PHILIP : Recent Advances in Plant Genetics.
COULTER : Evolution of Sex in Plants.

Also such special references as the teacher may suggest.

LL. B. EXAMINATION.

(For the Previous Examination of 1942.)

The following Text-books and Acts are recommended :—

Paper I.—Roman Law.

HADLEY : Roman Law.

MAINE : Ancient Law, Chapters 1, 2, 3, 6 and 9.

Paper II.—The Law of Contracts.

(*i*) ANSON : Principles of the English Law of Contracts.

(*ii*) POLLOCK AND MULLLA : Indian Contract Act (Act IX of 1872), Student's Edition.
Sale of Goods Act (Act III of 1930)

(*iii*) Indian Partnership Act, 1932.

(*iv*) University Selection of Leading cases.

Paper III.—The Law of Easements and Torts.

(*i*) UNDERHILL : Torts.

Or

RATAN LAL : Law of Torts.

(*ii*) The Indian Easements Act (Act V of 1882).

(*iii*) JOTI PRASAD : Law of Easements.

(*iv*) University Selection of Leading Cases.

Paper IV.—The Law of Evidence.

(*i*) RATAN LAL : Evidence Act.

(*ii*) University Selection of Leading Cases.

Paper V.— Criminal Law and Procedure.

*(*i*) RATAN LAL : Indian Penal Code, Student's Edition.

(*ii*) Code of Criminal Procedure, excluding the Schedule and Chapters 33, 34, 38, 43, 44A and 46.

(*iii*) University Selection of Leading Cases.

Paper VI.—Constitutional Law.

(*i*) DICEY : on the Law of the Constitution (omitting the chapter on 'Droit Administratif' and the Appendices).

(*ii*) The Government of India Act, 1935 (omitting Parts II, III, IV, VI to XII of the Sixth Schedule).

*Candidates will not be required to have a knowledge of the amount of punishment which can be inflicted for any offence.

(*For the Final Examination of 1943.*)

The following Text-books and Acts are recommended:—

Paper I.—Civil Procedure and Limitation.

(*i*) The Code of Civil Procedure (omitting Appendices).

(*ii*) MULLA: Commentary on the Civil Procedure Code (Students' Edition).

(*iii*) WALSH AND WEIR: Pleadings in India.

Or

MOGHA: The Law of Pleading in British India.

(*iv*) The Indian Limitation Act (omitting the schedule).

(*v*) Arbitration Act X of 1940.

Paper II.—The Law relating to Land Tenures, Rent and Revenue (U. P.)

(*i*) U. P. Tenancy Act No. XVII of 1939.

(*ii*) Act No. III of 1901 (United Provinces).

(*iii*) BADEN POWELL: Short Account of the Land Revenue and its Administration in British India.

Or

The Law relating to Land Tenures, Rent and Revenue (C. P.)

(*i*) Central Provinces Tenancy Act of 1920.

(*ii*) Central Provinces Land Revenue Act of 1917.

(*iii*) BADEN POWELL: Short Account of the Land Revenue and its Administration in British India.

(*iv*) University Selection of Leading Cases.

Paper III.—Hindu Law.

(*i*) MULLA: Hindu Law.

(*ii*) University Selection of Leading Cases.

Paper IV.—Mohammedan Law.

(*i*) WILSON: Digest of Anglo-Mohammedan Law. From the beginning of Part II to the end of the book.

(*ii*) MULLA: Mohammedan Law.

(*iii*) KASHI PRASAD: Muslim Law (Students' edition).

(*iv*) University Selection of Leading Cases.

Paper V.—The Law relating to Transfer of Property etc.

(*i*) The Transfer of Property Act (Act IV of 1882).

(*ii*) L. G. MUKERJI: Law of Transfer of Property.

(*iii*) University Selection of Leading Cases.

Paper VI.—Equity with special reference to Trusts and Specific Relief.

(*i*) The Indian Trusts Act (No. II of 1882).

(*ii*) The Specific Relief Act (No. I of 1877).

(*iii*) S. C. BAGCHI: Snell's Principles of Equity. Chapters on the History and Maxims of Equity, on Trusts, on Mistake, on Fraud—Actual and Constructive, on Specific Performance and on Injunctions, *i.e.*, Chapters 1 to 9, and 22 to 26.

(*iv*) University Selection of Leading Cases.

Paper VII.—Jurisprudence.

SALMOND: Juriprudence (omitting Appendices).

NOTE.—Every Act mentioned in the above list should be understood to mean the Act with all subsequent amendments thereof.

University Selection of Leading Cases.

I.—CONTRACTS.

Henthorn *v.* Fraser (1892), 2 Ch. 27.

Carlill *v.* Smoke Ball Co. (1893), I. Q. P., 256.

Mohori Bibee *v.* Dharmodas Ghose, 30 I. A. 114, I. L. R., 30 Calcutta 539

Lalman *v.* Gauri Dutt, 11 A. L. J. R., 489.

Derry *v.* Peek, 14 A. C., 337 (Lord Herschell's judgment).

Jamal *v.* Moola Davood & Sons, 43 I. A., 6: I L. R. 43 Calcutta, 493.

II.—TORTS AND EASEMENTS.

Lloyd *v.* Grace Smith & Co. (1912), A. C. 716 (Lord Macnaghten's judgment).

E Hulton & Co v. Jones (1910), A. C. 20.

Abrath *v* N. E Ry. Co. II Q B. D. 440 (Judgment of Bowen, L J.)

Butterfield *v.* Forrester, II East 60: 103 English Reports, 926.

Davies *v.* Mann. 10 M. and W., 546 : 152 English Reports 586.
Rylands *v.* Fletcher, L. R 1 Exch., 465.
Nichols *v.* Marsland, L. R. 2 Exch. Division I.

III —EVIDENCE.

Legal Remembrancer *v.* Lalit Mohan Singh, I L R., 49, Calcutta, 167.
Bela Rani *v.* Mahabir Singh, I. L. R., 34, All , 341.
Balkishen Das *v.* Legge, I. L. R., 22, Allahabad, 149.
Mohammed Sharif *v* Bande Ali, I. L R , 34, All., 36.
Sarat Chandra Dey and others, *v.* Gopal Chandra Laha and others, 29, Calcutta, 296.

IV.—CRIMINAL LAW.

R. *v.* Govinda, I. L. R., 1, Bombay, 342.
Ganouri Lal *v.* Q -E , I. L. R , 16, Calcutta, 206.
Amrita Lal Hazra *v.* K.-E., I. L. R., 42, Calcutta, 957.
Q.-E. *v.* Moss A. W. N. 1894, p. 23.
Mohd. Hussain *v.* K -E , 15 Oudh Cases, 321.
Tapti Prasad *v.* K.-E, 15 A. L. J. R., 590.

V.—C. P. RENT AND REVENUE LAWS.

Ram Dayal *v.* Enlabia Bai 4 N. L. R., 120.
Moti Chand *v.* Ikram-Ullah Khan, I. L R. 36, All , 73.
Bhagwan Das *v.* Gajadhar, 23 N L. R , 9.

VI.—HINDU LAW.

Hanooman Pershad Pandey *v.* Baboee Munraj Kunwaree 6 M. I. A., 393.
Raja Brij Narain Rai *v.* Mangla Pershad Rai and others, 51 I. A., 129 ; I. L. R. 46, All , 95.
Musammat Girja Bai *v.* Sadasiv Dhundiraj and others, 43, Cal , 1031.
Budha Singh *v.* Laltu Singh, 42 I. A. 208 ; 37, All., 604.
Isri Dutta *v.* Hansbutti, 10 I. A. 150 ; 10, Cal., 394.
Krishna Murti Ayyar *v.* Krishna Murti Ayyer, A. I. R., 1927, P. C. 139.
Amarendra *v.* Sanatan; 60 J. A. 242.

VII.—MOHAMMEDAN LAW.

Gobind Dayal *v.* Inayat Ullah, I. L. R., 7 All., 775.
Jafri Begam *v.* Amir Muhammad Khan, I. L. R., 7, Allahabad, 822.

Habibur Rahman, *v.* Altaf Ali, I. L. R , 48, Calcutta, 856 (P. C.)

Muhammad Junaid *v.* Aulia Bibi, I. L. R., 42, All., 497.

Fakur-ud-din *v.* Kifayat-ul-lah (1910), 7 A. L. J. R., 1095.

VIII.—TRANSFER OF PROPERTY.

Beni Ram *v.* Kundan Lal, 21, All. 496 ; 26 I. A. 58.

Gokul Dass Gopal Das *v.* Puranmal Premsukhdas 10, Cal. 1035 (P. C.)

Ramcoomar Koondoo, *v.* Jahan and Maria Mc Queen. II Beng. L. R. 46 (P. C.)

Webb *v.* Macpherson, I. L. R., 31 Cal., 57 (P. C.)

Raja Kishendatt Ram *v.* Raja Mumtaz Ali Khan, 5, Cal., 198 (P. C.)

IX.—EQUITY.

Gopi Nath *v.* Kunj Bihari Lal, I. L. R., 34 All., 306.

Burn & Co. *v.* McDonald, 35 Cal., 354.

Mussoorie Bank Ltd. *v.* Albert Charles Raynoor, 4 All., 500.

Nagendrabala Dasi and another *v.* Dinanath Mahish and others, 51, Calcutta, 299.

Books recommended for Leading Cases—

BRIJ NATH MITHAL : University Selection of Leading Cases for Law Final. (Gaya Prasad and Sons, Agra).

BRIJ NATH MITHAL : University Selection of Leading Cases for Law Previous. (Gaya Prasad and Sons, Agra).

LL. M. EXAMINATION, 1943.

The following Books are recommended :—

Compulsory Subjects.

I. Jurisprudence and Principles of Legislation—
- Holland : Jurisprudence.
- Salmond : Jurisprudence.
- Green : Theory of Political Obligations.
- Gray : Nature and Sources of Law.
- Maine : Ancient Law.
- Maine : Early History of Institutions.
- Bentham : Theory of Legislation.
- Dicey : Law and Opinion of England.
- Laski : Authority in the Modern State.
- J. Brown : Austinian Theory.
- J. Brown : Underlying Principles of Legislation.
- Clark : Practical Jurisprudence.
- Holmes : Common Law.
- Garner : Introduction to Political Science.
- Maxwell : Interpretation of Statutes.
- Joad : Introduction to Modern Political Theory.

II. Constitutional Law, British and Indian—
- Anson : Law and Customs of the Constitution.
- Medley : English Constitutional History.
- Thomas : Leading Cases in Constitutional Law.
- Marriot : Mechanism of the Modern State.
- Archibald : Outlines of Indian Constitutional History.
- Ridges : Constitution.
- Mukerji : Indian Constitution.
- Mukerji : Indian Constitutional Documents.
- G. N. Singh : Constitutional Development of India.
- Frederick Whyte : India—A Federation ?
- H. D. Hall : The British Commonwealth of Nations.
- Sidney Law : Governance of England.
- Davidson : Report of the Round Table Conference Committee on Federation.

III. Roman Law—
- Moyle : Institutes of Justinian.
- Poste : Institutes of Gaius.
- Muirhead : History of Roman Law.

SOHM : Institutes of Roman Law.
BUCKLAND : Principles of Roman Private Law.
ROBY : Introduction to the Digest.

IV. *Either* (*a*) Hindu Law or (*b*) Mohammedan Law.

(*a*) Hindu Law—
SETLUR : Collection on Law of Inheritance.
MAYNE : Hindu Law.
SARKAR : Mimansa Rules of Interpretation.
GOLAB CHANDRA SHASTHI : Hindu LAW.
BANERJI : Marriage and Stridhan.
SARKAR : Adoption
SARVADHIKARI : Inheritance.
SEN : Hindu Jurisprudence.
Dattaka Chandrika and Dattaka Mimansa, translated by Ghosh.
Mitakshara, Vyavaharadhyaya, translated by Gharpure.
GANAPATI AIYER : Law of Endowment.
Yajnavalkya Smriti.
Dayabhaga.

(*b*) Mohammedan Law—
WILSON : Anglo-Mohammedan Law.
AMIR ALI : Mohammedan Law.
SIRDAR, S. C. : Mohammedan Law.
TYABJI : Mohammedan Law.
ABDUR RAHIM : Principles of Mohammedan Law.
JUNG : Administration of Justice in Muslim Law

OPTIONAL SUBJECTS.

Only *two* out of the following may be taken :—

I. *Either* (*a*) Hindu Law, *or* (*b*) Mohammedan Law, whichever is not taken as a compulsory subject.

(*a*) Hindu Law—as under compulsory subjects.

(*b*) Mohammedan Law—as under compulsory subjects.

II. Law of Contracts—
POLLOCK : Law of Contracts.
STREET : Foundation of Legal Liability, Vol. II.
SMITH : Leading Cases on Law of Contracts.
BOWSTEAD : On Agency.
LINDLEY : Partnership.
SALMOND : Law of Contract.

MAYNE : Damages (relevant portions).
BANERJI : Specific Reliefs.

III. Transfer of Immovable Property and Easements—
GHOSE : On Mortgages.
WILLIAMS : Real Property.
TUDOR : Cases on Real Property.
WILLIAMS : On Vendors and Purchasers.
MUKERJI : On Perpetuities.
GALE : On Easements.
PEACOCK : Law of Easements.

IV. Equity—
STORY : Equity Jurisprudence.
UNDERHILL : Trusts and Trustees.
LANGDELL : Equity Jurisprudence.
BANERJI : Specific Relief.
WHITE AND TUDOR : Leading Cases on Equity.
KERR : Injunction
FRY : Specific Performance.

V. International Law, Public and Private—
(*a*) Public.
HALL : International Law.
OPPENHEIM : International Law.
PITT CABBETT : Leading Cases on International Law.
(*b*) Private.
DICEY : Conflict of Law.
WESTLAKE : Private International Law.

VI. Wills and Administration.
SEN GUPTA : Indian Succession Act.
THEOBALD : Treatise on Law of Wills.
WILLIAMS : Law of Executors and Administrators.
UNDERHILL AND STARAHAN : On Interpretation of Wills and Settlements.

NOTE —The candidates are advised to consult the Tagore Law Lectures on the subjects pertaining to the prescribed course of study Indian Acts pertaining to the subjects, together with all subsequent amendments up to six months preceding the date of examination, should also be studied with the help of standard commentaries

FIRST YEAR B. Com. COURSE.

The subjects of instruction and examination shall be as follows :—

1st Year.

(1) English.
(2) Elements of Economics.
(3) Elements of Currency and Banking.
(4) Book-keeping and Accountancy.
(5) Business Methods.
(6) Economic and Commercial Geography.

A departmental examination will be held at the end of the first year.

(1) *English.*

Questions will be set on the following :—

(*a*) Draft of Commercial and Official Correspondence.
(*b*) Explanation of terms and passages occurring in market reports.
(*c*) Precis of a suitable passage.
(*d*) Re-writing of incorrect or badly constructed sentences.
(*e*) An essay on a subject of general interest.

(2) *Elements of Economics.*

Production.—Analysis of the expenses of production factors which limit Supply.
Exchange.—Prices ; Laws of Supply and Demand.
Consumption.—The basis of demand ; wants ; budgets ; and the division of Income.
Distribution.—Rent, Interest, Wage, and their difference.
The Supply of Capital and Credit ; Co-operative credit.
The Supply of Labour and population.
Organization and Management—The Principle of Substitution.
Large and small-scale production.
Division of Labour. Machinery.

(3) *Elements of Currency and Banking*—

(*a*) *Currency.*—The origin of money, barter, grain payments. Money and its functions. Coins

and the currency system, legal tender. Standard and token money. Legal basis of money. Mint price of gold or silver, parity of exchange. Gresham's Law. Paper Currency. Convertible and inconvertible credit instruments. Bills of exchange, cheques, hundies.

(*b*) *Banking.*—The functions of a bank. Balance-sheet. The cheque system and the clearing house. Means of inland remittance. Growth of Banking in India: Mahajans, Chetties, Shroffs. Early joint-stock banking. The Presidency Banks. The Imperial Bank. The present joint-stock Banks—European and Indian. Government control of banks. Information to be made public. Other means of protecting customers. Post Office Savings Banks. An elementary treatment of the present system of currency (including paper currency) in India.

(4) *Book-keeping and Accountancy*—

The Principles of Double Entry Book-keeping and their Application. Books of Original Entry. The Ledger. Trial Balance. Trading and Profit and Loss Accounts, with apportionments. Balance-Sheet.

In the treatment of the above, the following matters will be included:—

Cheques, Bills of Exchange and Promissory Notes; Goodwill; Classification of Assets; Bad Debts; Depreciation and Reserves (elementary); Consignments; Joint Venture and Contract Accounts; Elementary Partnership and Company Accounts.

(5) *Business Methods*—

The general routine of a Business House; Inward and Outward Correspondence, including Drafting and Filing. Methods of Rapid Communication. Duplicating Processes.

The significance of Trade. Commerce and Industry. Manufacturing and Distributing Houses. The buying and selling of goods. Importation and Exportation with an elementary knowledge of fire and marine insurance as applicable thereto.

The meaning of the principal commercial terms occurring in connection with the above, and preparation of

the chief documents involved, including the arithmetical calculations.

(6) *Economic and Commercial Geography—*

Climate—Annual distribution of temperature and rainfall with causes ; how these factors divide the world into climatic regions.

Natural regions of the world in relation to climatic regions : their natural vegetation, animal life, occupations and products.

Soil (outline only)—Classes and properties, preservation of soil—irrigation, dry-farming.

Commercial Products.—Each according to its properties and utility, requirements of climate, soil etc., distribution and commercial importance (*a*) generally, (*b*) in India.

1. Vegetable products, including forest products.
2. Animal commodities.
3. Fisheries.
4. Mineral Wealth.

Sources of power. Studies of distribution maps. Growth of Towns Means of Transport.

B. Com. EXAMINATION, 1943.

I. English—

Paper I.—Text and General English.

This paper will consist of *two* parts. The first part will contain questions on prescribed prose text-books of the B. A. standard, including critical and explanatory questions dealing with the subject matter.

Prescribed books—

(1) Ruskin's Crown of Wild Olive.—The following lectures only—

(*i*) Lecture on Work.

(*ii*) Lecture on Traffic.

(2) (*a*) Essays by Sir Arthur Helps (Walter Scott Ltd, London). The following Essays only—

(*i*) On Practical Wisdom. (*ii*) Aids to Contentment. (*iii*) On Self-discipline. (*iv*) On our judgement of other man. (*v*) On the exercise of Benevolence. (*vi*) Domestic rule. (*vii*) Advice. (*viii*) Secrecy. (*ix*) On the education of a man of business. (*x*) On the transaction of business. (*xi*) On the choice and management of Agents. (*xii*) On the treatment of Suitors. (*xiii*) Interviews. (*xiv*) Of Councils, commissions etc. (*xv*) Party spirit.

Or

(*b*) Dickinson and Sharma: Twentieth Century Addresses, omitting the addresses on Criticism, Jargon, and Aphorisms.

(3) My Life and Works, by Henry Ford (William Heineman Ltd.) (Introduction and Chapters I and II only).

Questions on Text shall be confined to the general subject matter, and purely literary questions shall not be put.

The second part will consist of questions on General English, comprising one or more unseen prose passages for summarising or explanation of the same standard as for B. A. or B. Sc. General English.

Paper II.—An essay on a subject of Economic or Commercial interest.

II. Commerce—

Paper I.—Business Organisation.

1. Nature and constitution of business houses (sole traders, partnerships and joint stock companies). Business combinations.
2. Methods of financing business concerns and industrial finance.
3. Organisation of retail houses (including departmental stores, multiple shops and mail order concerns), wholesale houses and manufacturing businesses.
4. Formation and working of joint stock companies, including secretarial work.
5. Modern methods of publicity.
6. Insurance.
7. Stock and produce exchanges, including a study of stock and commodity market reports.
8. Methods of remunerating labour. Welfare work. Scientific management. Rationalisation
9. State in relation to industry.

Books recommended—

DAVAR : Business Organisation.
HANEY : Business Organisation.
THOMAS : Commerce
SHIELDS : Industrial Organisation.

Paper II—Commercial and Industrial Law.

1. The Indian Law relating to Contracts (including sale of goods, bailments, indemnity and guarantee, agency and partnership), negotiable instruments, arbitration and insolvency.
2. Elements of Company Law.
3. The labour legislation.
4. Law of Income-tax.

Books recommended—

DAVAR : Mercantile Law.
SEN AND BANERJI : Mercantile Law.

Paper III.—Statistics.

1. Meaning and scope of statistics Fundamental principles.
2. General methods of statistical investigation. Collection of statistical data. Determination of

statistical units. Sources of data. Estimation. Classification of statistical observation.

3. TABULAR PRESENTATION.—Single tables—frequency tables—correlation tables—abstraction—mechanical tabulations.

4 DIAGRAMMATIC PRESENTATION.—Cartogram—Bar diagram—Polar diagram—Surface diagrams, rectangular and circular. Volumes of three dimensional diagrams—conventional forms.

5. GRAPHIC PRESENTATION.—Histograms—simple percentage cumulation. Histograms—absolute percentage—Trend.

6. AVERAGING.—Types of averages—simple, weighted, model, median, moving average—statistical coefficient.

7. METHODS OF DISPERSION —Meaning and purpose—absolute and relative dispersion—the Range—mean deviation—standard deviation—quartile deviation—'mean difference'—skewness.

8. Principles of index number making and using—the Base—the choice of an average weighing method of aggregates—relatives of aggregates—average of relatives—chain averages.

9. INTERPOLATION.—Graphic and simple algebraic methods.

10. Correlation and ratio of variation. Karl Pearson's Co-efficient of correlation. Application to groups —series, long-time and short-time fluctuations. Methods of concurrent deviation—Lag-Galton graph and regressions.

11. Application of statistical methods to Indian commercial problems: prices, wages, trade and transport. Certain sources of official statistics in India.

Books recommended—

KING : Statistical Method.

BODDINGTON : Statistics.

DUBEY AND AGARWALA : Elementary Statistics.

III. Economics—

Paper I.—Principles of Economics.

1. INTRODUCTORY.—Scope and subject matter of the science. Its divisions and their inter-depen-

dence. Economics, a part of Sociology. Relation of Economics to other sciences.

2. METHODS.—Deductive and Inductive methods as applied in Economic Science.
3. DEFINITIONS.—*e. g.*, Wealth, Labour, Value, Money, Price, Capital, Land etc.
4. CONSUMPTION.—Wants. Definitions of total and marginal utility. Demand schedules and curves. Elasticity of demand. Consumers' surplus. Fashions and Customs with their effects on Demand.
5. PRODUCTION —The factors or agents of production: Land, labour, capital and organization. Combination of the factors in varying proportions. Relations of the Law of Diminishing Returns and Investment.
6. LAND OR NATURAL RESOURCES.—Qualities, situation and fertility, climate, minerals, sources of power.
7. LABOUR.—Distinctive qualities, skilled and unskilled labour, division of labour, conditions of efficiency of labour, Influence of social customs.
8. CAPITAL.—Conditions of accumulation of capital. Economic characteristics of machinery.
9. ORGANIZATION of PRODUCTION.—Large and small scale productions, advantages and limitations of each Supply schedules and long period cost of production curves. Diminishing, Constant and Increasing returns. Principle of substitution. Inventions. Specialisation of the factors of production. Localisation of industries.
10. CO-OPERATION. Agricultural and Urban, the theory and organization of credit, distributive and purchasing societies, co-operative production—its advantages and its weaknesses.
11. EXCHANGE.—Theory of barter. Conditions of gain of utility by exchange. Definition of a market Extent of the market. Balancing of supply and demand. Temporary equilibrium of demand and supply. Joint supply and composite demand. Short and long period. Equilibrium of demand and supply. Monopolies.

Determination of monopoly price in actual practice. Speculation and organized markets.

12. DISTRIBUTION.—Balance of demand and supply for the factors of production. The principle of substitution. Mobility of the factors of production. Effects of introducing new methods and inventions

13. RENT.—Gross and net rent The Law of Rent. Economic Rent, various forces determining it. Effects of improvements in Agriculture and transportation on rents. The relation of the law of diminishing returns to rent

14 INTEREST.—Demand for and supply of capital. Differences between short and long term investments. Mobility of capital between localities, between industries and from less to more specialised forms of fixed capital. Gross and net interest. Tendency to equal return on equally risky investments. The rate of return and the rate of interest. Quasi-Rent.

15. WAGES AND THE POPULATION QUESTION.—General conditions effecting demand for and supply of labour. Positive and preventive checks. Real and nominal wages. Apparent differences in wages. Mobility of labour. Differences of wages in short periods; their equalisation. Time and piece wages. Relation of labour and capital. The relation of population to the law of Diminishing Returns. Over-population and under-population.

16. PROFITS.—Normal profits as the reward of management and risk-taking, and surplus profits as the result of special advantages in time, place and legal rights.

17. Causes of national wealth and progress.

Books recommended—

TAUSSIG : Principles of Economics, Vols. I and II.
THOMAS : Elements of Economics.
F. BENHAM : Economics (Pitman).

Paper II.—Currency and Finance.

Currency.—The functions of money ; qualities of good money material ; importance of money ; various kinds

of money. Quantity theory of money value. Inflation and deflation. Index numbers. Various methods of Note Issue War and the ruin of the gold standard. Post-war restoration of the gold standard: Economic depression and the gold standard.

Banking.—The nature of Banking; Types of Banks; functions of a modern banker; banking operations. Banking and money market. Fluctuations in Bank rate in relation to trade, industry and commerce.

The Indian currency system, a brief historical retrospect from 1870 to 1925. Recommendations of the Hilton Young's Currency Commission, 1926. The present currency system in India

Indian Banking System.—Exchange banks. Joint-Stock banks Co-operative banks. The Imperial Bank. The Reserve Bank of India. Defects of Indian Banking organisation. Lines of future Banking Development.

International Trade and Foreign Exchange—Advantages of Foreign Trade. International currency. Mint Par, Specie Points. Fluctuations in the rate of exchange. Exchanges during the war and post-war exchanges.

Public Finance.—Classification of Public Revenues and Expenditure—Canons of Taxation, Incidence of Taxation, Public Debt, Principal heads of income and expenditure of the Central and the Provincial Governments in India.

Books recommended—

KRISHNA KUMAR SHARMA : Indian Money Market.
KRISHNA KUMAR SHARMA : Currency and Commerce.
JATHER AND BERRY : Indian Economics, Vol. II.
HARROD : International Economics (Camb. University Press).
G. D. I. COLE : What Everybody Wants to Know About Money (relevant portions).
L. C. JAIN : The Monetary Problems of India.
C. N. VAKIL : Currency and Prices in India.

Paper III.—Modern Economic Development of India and England.

1. The influence of geographical and social factors on economic development—Growth of economic freedom—Caste in India—Differences in econo-

mic outlook and in the course of economic development.

2. Economic organisation of England and India from 1760—Later Developments.
3. LAND AND AGRICULTURE —The English agrarian revolution and its results —Land tenures in India—International competition in the world markets and its effects on English and Indian agriculture—Problems of to-day in the two countries—Large versus small holdings, marketing, rural credit, improvements of land and of technique, cottage industries—Irrigation and Drainage problems.
4. INDUSTRIAL DEVELOPMENT AND LABOUR PROBLEMS.—Domestic system of manufactures—the *karkhanas* in India—Rise of Factory Industries, causes and effects—other organized industries. Work and wages, supply of labour. Housing conditions. Social Insurance. Workmen's Compensation, Factory Act, Trade Unionism—The Problem of Industrial efficiency—Future of industrialism in the two countries.
5. TRANSPORT —Brief review of transport conditions before the Railway era in England and India—Railway development—Railway finance and organisation—State control and amalgamation—Rivers and canals as inland highways—Growth of the carrying trade and shipping—the Navigation Acts of England—Decline of Indian shipping—India's demand for the reservation of her coastal trade.
6. TRADE AND TARIFFS—Indo-British and Imperial trade about the middle of the eighteenth century —Colonial preference—Effects of the English Industrial Revolution on Indian and English trade—Free Trade—"Fair Trade" and Imperial Preference—Economic policy of the East India Company and its effects—Fiscal policy under British rule—Economic nationalism in India and the demand for protection—the Great War and its influence on trade and tariff policy—The Ottawa Pact.

Books recommended—

For England :

MEREDITH : Economic History of England.

KNOWLES : Commercial and Industrial Revolutions

JONES : Britain in Depression, (Pitman).

JONES : Britain in Recovery, (Pitman).

ALLEN : British Industries (O. U. P.).

For India :

JATHER AND BERRY : Indian Economics, Vols. I and II.

VERA ANSTEY : Economic Development of India.

GADGIL : Model Industrial Evolution of India.

The Indian Year Book, latest edition.

IV. SPECIAL SUBJECTS.

(a) Advanced Accountancy and Auditing.

Paper I.

Principles and practice of Double Entry Book-keeping. Capital and Revenue. Depreciation, Reserves and Sinking Funds.

Partnership accounts. Accounts of limited companies, including reconstructions, amalgamations and liquidations. The Double Account system. Departmental and Branch accounts. Insolvency accounts. Bank and Insurance companies accounts.

Paper II.

1. Income-tax in relation to accounts.
2. Interpretation and Criticism of published accounts.
3. *Either* elements of cost accounting *or* the principles and practice of Indian system of Accountancy.

N B —One-half of the full marks of this paper shall be assigned to questions on Income-Tax in relation to accounts, and the other half of the full marks shall be allotted to questions on the rest of the course of this paper

The questions on the Indian System of Accounts may be answered in Hindi, Urdu or Muria script

Paper III.

The objects and scope of audit. Vouching and verification. Audit of revenue accounts and balancesheet. Depreciation and reserves. Divisible profits and dividends.

Rights, duties and liabilities of auditors.

Special points arising in the audit of banks, cinemas, hotels and jute, cotton, tea, coal, sugar, electric supply, light railway and insurance companies.

Investigation of Accounts.

Books recommended—

SPICER AND PEGLER : Book-keeping and Accounts.
BATLIBOI : Advance Accounts.
CROPPER : Accounting.
DE PAULA : Principles of Auditing.
LANCASTER : Principles and Practice of Auditing.
BODDINGTON : Financial Statements (Pitman).
K. M. BANTHIYA : Hindi Bahi Khata (Rajputana Book House, Ajmer).

(*b*) *Advanced Banking.*

Paper I.

1. Recent Monetary History and Monetary Controversies. Recent discussions of the nature and adequate definition of money. The problem of the Standard. The triumph of the Gold Standard in the last third of the nineteenth century. The re-opening of Controversy re : Bimetallism, The Gold Exchange Standard, the Theoretical implications of the Gold Exchange Standard. The effects of the War—Inflation and Dislocation of Exchanges. The rise of prices and the suggested stabilisation of the value of money. Fisher's Compensated Dollar. Banking Policy and the Price Level. The spread of Banking and the evolution of Banking theory. The War and the ruin of the Gold Standard. Cassel's theory of the Foreign Exchanges. The monetary theory of the Brussels and Geneva Conferences. Monetary stability. The return to Gold. Present Problems.
2. International Trade. The Principles governing the existence and distribution of international trade. Statistical problems in the measurement of international trade. The organization and operation of international markets. The balancing of international indebtedness. Taxes on

Imports and Exports. Incidence of such taxes. Protection and Free Trades. Imperial Preference.

3. Foreign Exchanges. Types of bills of exchange. —The mechanism of foreign exchange payments. Foreign exchange markets. Bankers and foreign exchanges. The rates of exchange. Purchasing power parity. Influences effecting the rate. Forward exchange. Arbitrage. The silver exchange. Dislocation of exchanges. The problem of stabilisation. How to read the foreign exchange article.

Paper II.

1. A detailed study of the Indian Money Market. Defects of Indian Banking. Effects of the War. A Central Bank for India. Adequacy and stability of the money market in India. Agricultural credit. Agricultural indebtedness. Co-operative credit, its development and present position. Industrial Banking and Finance in India. Indian Public Debt. Post Office Cash Certificates. Means to promote banking development.
2. A detailed study of the Indian Currency System. Currency Policy in India. The Gold Exchange Standard, its working in other countries.
3. Comparison of the banking systems of England, Germany, France, the U. S. A. and India. Recent banking developments.

Paper III.

1. The ordinary practice of bankers with regard to the opening and conduct of banking accounts. Cheques: forms, endorsements, crossings, forgery and alteration, banker's marks on cheques, termination of banker's authority to pay cheques, Bills of exchange: forms, endorsements, acceptance, acceptance for honour, case of need, noting protest, stamp duties, discharge of a bill. Theory and characteristics of negotiability. Discounting of bills of exchange.
2. Banker's credits: traveller's letters of credit, circular notes, confirmed banker's credits, un-

confirmed banker's credits, London acceptance credit, documentary credit, revolving credit.

3. Banker's advances : advance against marketable securities, goods and produce, real property, ships, guarantees, debts, debentures of companies. Unsecured advances.
4. Banking Investments : Deposit of valuables with the Bank. Banks and customers. Mechanism of the clearing house system.
5. Bank organisation, management and accounts.
6. Banking law : relating to cheques, bills of exchange, promissory notes.

Books recommended—

DADACHANJI : History of Indian Currency.
TANNAN : Practice and Law of Banking.
DAVAR : Practice and Law of Banking.
DAVIS : Bank Organisation and Management.
SPALDING : Bankers' Credits.
KISCH : Central Banks.
DUNBAR : Theory and History of Banking.
PANANDIKAR : Banking in India (Longmans).
Reports of the Indian Currency Committees and Commissions.
Report of the Indian Fiscal Commission.

(*c*) *Geography.*

Paper I.

1. Physical Geography involving a broad knowledge of rocks, denudation, land forms, soils—formation, classes, use, maintenance, etc.—important economic minerals and their distribution.

2. The atmosphere—Temperature and pressure of the air ; movement of atmosphere ; winds ; cyclones and anti-cyclones ; Permanent winds ; rainfall ; major climatic types and co-related vegetation and animal-life. Reading of climate and weather maps.

3. Production and trade in important commodities together with the industries based on them such as : Rice, Wheat ; Tea, Sugar ; Cotton, Wool, Jute ; Coal, Iron and Petroleum ; Chemicals and Fisheries.

4. Transport : (*a*) A few important trans-continental railways and their significance ; (*b*) important ocean

routes ; (*c*) important air routes, particularly to India and the Far East and their commercial significance ; (*d*) Trade Centres, Port towns and industrial Centres.

Books recommended—

NEWBIGIN : Physical Geography.
CHISHOLM AND D. STAMP : A Handbook of Commercial Geography.
RUSSEL SMITH : Industrial and Commercial Geography.
GREGORY : Economic Geology.
LYDE : A Primer of Economic Geography.
R. N. DUBEY : Economic and Commercial Geography of the World.
A. WILMORE : Groundwork of Modern Geography.
PICKS : Introduction to Meteorology.

Paper II.

General Economic and Commercial Geography of Asia with special reference to India. This will involve a study of the physical features, climate, natural vegetation, mineral resources, sources of power, agriculture, industries and trade of the leading countries on a regional basis.

Books recommended—

BERGOMERG : Economic Geography of Asia.
L. D. STAMP : Asia.
VERA ANSTEY : Trade of the Indian Ocean.
LYDE : Asia.
Indian Year Book (Times of India, Bombay).
Indian Finance Year Book.

Paper III.

A study of *any one* of the following on the same lines as above :—

(*i*) North America and Europe with special reference to Great Britain and U. S. A.

Or

(*ii*) The Southern continents with special reference to British Dominions.

Books recommended :—

SHACKLETON : Regional Geography of Europe.
LABORDE : Western Europe and British Isles.

LYDE : Continent of Europe.
JONES AND BRYEN : North America.

or

RUSSEL SMITH : North America.
WHITBECK : Geography of South America.
SUGGATE : Africa.
TAYLOR: Australasia (Physiographical and Economic).
WHITBECK AND FINCH : Economic Geography.

(*d*) *Insurance.*

Paper I.—Life Assurance.

Principles and practice of life assurance. Use and purpose of the proposal and forms associated therewith. Life assurance contracts ; their nature and characteristics. Insurable interest. Parties to the contract and their rights and duties. Conditions and terms of policy and effect of non-compliance therewith. Assignment, claims, surrenders. Reassurance. Types of assurance. The prospectus —its general construction and uses.

Life office organisation : practice in connection with collection of premiums, revivals, loans, surrenders, claims and annuity payments. Compilation of statistics and records.

Mortality tables : the general nature, characteristics and use of the principal tables, including an elementary knowledge of the methods of construction. Life office valuations ; sources of profit and methods of distribution.

Paper II.—Other Classes of Insurance.

Fire. The basic principles of fire insurance contracts. Fire policy conditions and their meanings. Insurable interest. Assignment policy. Subrogation. Contribution, average, claims, proximate cause, onus of proof, abandonment and reinstatement. Average clauses and loss apportionments.

Marine. Contract of marine insurance. Insurable interest and value disclosure and representation. The slip and policy. Premium and return of premium. Double insurance. Assignment of policy. Warranties ; the voyage ; loss and aban-

donment; partial losses and particular charges; salvage; general average; measure of indemnity. Subrogation General Average. Lloyd's.

An elementary knowledge of workman's compensation insurance, motor insurance, accident insurance and burglary insurance.

Paper III —Insurance Office Organisation.

Constitution of insurance companies. Office; machines; staff organisation, management and remuneration Officers of the company. Insurance organisations Correspondence. Advertising. Branch control Agency. Secretarial Matters. Various returns under the Indian Companies Act and the Indian Life Assurance Companies Act. Insurance Accounts and investments

Books recommended—

YOUNG: Insurance (Pitman).

LEIGH: Guide to Life Assurance (Pitman).

TAYLOR AND TYLER: Life Assurance from Proposal to Policy (Pitman).

ELDERTON AND FIPPARD: Construction of Mortality and Sickness Tables (A. & C. Black, Ltd.)

Indian Life Assurance and Provident Insurance Societies Acts and Rules thereunder.

T. D. DUTT: Law Relating to life Assurance in India.

BROOKE: Fire Insurance Principles and Practice (Post Magazine, London).

GODWIN: Principles and Practice of Fire Insurance (Pitman).

TEMPLEMAN: Marine Insurance (Macdonald and Evans, London).

EKE: Principles of Insurance (Pitman).

WATSON: Talks on Insurance Law (Pitman).

WELSON AND SHERRIFF: Insurance Office Organisation (Pitman).

WELSON and HAMMOND: Insurance Accounts and Investments (Post-Magazine, London).

(e) Rural Economics.

Paper I.

(*a*) Peculiar features of agricultural production as distinguished from manufacturing. Bases of

agriculture; soil, sources of power, irrigation, drainage, implements and machinery, seeds, manures and cattle. Study of these with special reference to Indian conditions. Systems of farming in India and various types of rotation, combination and distribution of crops met with in India. Agricultural improvement and the work of the Agriculture Department in India. Marketing of Agricultural produce.

(*b*) Village communications.

(*c*) Marketing of agriculture produce.

Paper II.

Types of villages in India. Historical survey of land revenue in India. Systems of revenue settlements. Principles of assessment. Consolidation of agriculture holdings. Ricardian theory in relation to land revenue in India. Application of the principles of taxation to land revenue. Tenancy legislation in the U. P. Organisation for the administration of land revenue.

The importance and possibilities of cottage industries, including subsidiary agricultural industries such as dairy farming, poultry farming, fruit culture and market gardening, etc.

Constitution, functions, and finances, of district board and village ***panchayats.***

Paper III.

Rural indebtedness: its causes and remedies State policy regarding rural indebtedness with special reference to U. P. Measures to avoid unnecessary debts. Restrictions on the transfer of land. The village money-lenders. Co-operative credit movement. Co-operation in Germany and Denmark. Its usefulness to India Acts of 1904 and 1912. The various co-operative societies and their achievements. State in relation to co-operative movement Land mortgage banks and State help to them. The Madras and Bombay schemes.

The rural reconstruction movement, village administration, sanitation, recreation and housing.

Books recommended—

Government of India Resolution on Land Revenue Administration in India of 1902.
SELIGMAN : Economics of Farm Relief.
HOWARD : Crop Production in India.
N G. MUKERJI : Hand-book of Indian Agriculture.
CARVER : Principles of Rural Economics.
HOLMES : Economics of Farm Organisation and Management.
Report of Royal Commission on Agriculture in India.
U. P. District Boards and Village *Panchayats* Acts.
Report on the Working of District Boards in U. P.
U. P. Banking Enquiry Committee Report.
B G. BHATNAGAR : Co-operative Organisation in India.
H. L. KAJI : Co-operation in India.
STRICKLAND : Co-operation in India.
BRAYNE : Remaking of Village India.
DARLING : The Punjab Peasants in Prosperity and Debt.
OAKDEN : Report on Co-operation in the United Provinces.

(*f*) *Secretarial Practice.*

Paper I.

A detailed study of the Indian Companies Act, together with rules made thereunder.

Paper II.

Company secretarial work and practice, including office organisation and management.

Paper III.

Company accountancy. Indian Income-Tax law. Practical Commerce and Finance.

B. Sc. (Ag.) EXAMINATION, 1943.

AGRICULTURE.

Paper I.—*Crops and Cropping Schemes*; *Soil Development.*

(1) Crops and Cropping Schemes.

Arrangement of cropping schemes; the following classes of crops to be dealt with:—

Cereals, fibres, oil-seeds, roots, legumes, fodders and miscellaneous.

Principles underlying rotation of crops; Distribution of cropping schemes according to soils and climate with special reference to the United Provinces; Cropping schemes for the following classes of farming:—

(*i*) Mixed arable.
(*ii*) Intensive.
(*iii*) Extensive.
(*iv*) Dairy.
(*v*) Stock, including pasture.

Factors affecting cropping schemes; improvements in grades of soil by judicious cropping; Acid and the alkali soils and their improvements by suitable cropping.

(2) Irrigation and Drainage.

Irrigation.—Hydraulics, purpose and practice of irrigation; drainage.

Hydraulic terminology including cusec, duty of water, head of water, wastage, *osra bundi*, depression or infiltration head; losses by evaporation and seepage; water requirements of different crops; measurement of water and hydraulic formulae

Necessity for irrigation by artificial means; sources of water for irrigation and their scope; wells, reservoirs and canals; irrigation practice and drainage in the United Provinces.

Canals.—Canal systems in India and the United Provinces, productive and protective canals; working of canals; types of outlets, canal rates; feasibility of charging by actual volume, meters, modules, semi-modules. Reservoirs and embankments—brief explanation of the principles governing their construction.

Wells.—Percolation wells, lined and unlined; their relative merits; principles of construction of masonry wells, cost. Improvement of well supplies by boring, mota or cavity wells and small strainer wells.

Tube-wells.—Comparison with masonry wells; their design, construction and yield, their special utility in intensive farming, their possibilities in the different districts of the United Provinces; cost, and their adaptation in western districts for extensive farming through cheap electric power.

Irrigation practice and Drainage.—Distribution and economy of water, different systems of irrigation and their relative advantages, over-irrigation and the attendant evils; objects of drainage; conditions requiring drainage; types of drains and relative costs, cost of drainage in relation to crop production; alignment and design of drainage channels; types of outlets

(3) Soil Development.

General Soil Management.—Practices of cultivation as regards time of cultivation and the implements used. Levelling; precaution to be taken; prevention of scouring, subsoiling costs; Machinery used in sub-soiling and levelling; soil sickness, including toxicity, acidity and alkalinity; Soil micro-organisms

Manures.—Necessity of manures; Time of manuring and method of application; Conservation of manures, Effect and valuation, Units

Land Development.—Improvements by scientific treatment of land otherwise unproductive, Capital outlay; Probable profits and time taken for a return on investment; Reclamation of acid and alkaline lands; Afforestation of waste lands unsuitable for cultivation, probable returns on investment, development of shallow soils, eradication of pernicious weeds, improvement of pasture land, cost of such improvement, well boring, capital outlay and probable returns on idle lands, investment—agricultural, in machinery, for land development, precautions to be taken, probable return on such investment, poultry, goat, and sheep farming, outlines of improved practices of suitable breeds, their care and management, probable outcome and returns.

Practical I.—Crop Culture.

(*a*) Practical study of the field and garden crops, their methods of cultivation, improved and indigenous, yield and cost per acre ; Storage and disposal of produce

(*b*) Special attention will be devoted to the following crops representing their classes : —

Field Crops.—Sugarcane , Wheat ; Rice ; Oats ; Millets ; one fodder grass ; Lucerne ; Cotton ; Sunnhemp ; Arhar ; Potato ; Mustard : Linseed ; Tobacco.

Vegetable Crops.—Cauliflower , Carrot ; Onion ; Tomato ; Brinjal ; Chillies.

Garden Crops.—Mango ; Lime ; Guava ; Banana ; Papaya ; Ber.

(*c*) Students are expected to be familiar with methods of cultivation elsewhere and other matters of general interest connected with the special crops.

(*d*) The students will visit—

(*i*) Holdings of the cultivators, and

(*ii*) Government and Private farms and gardens.

(*e*) The records of the field operations and reports on the places visited will be produced at the final examination.

per II.—*Farm and Estate Management ; Engineering.*

(1) FARM AND ESTATE MANAGEMENT.

Principles underlying successful management of farm maintained for—

(*a*) Experiments.

(*b*) Demonstrations.

(*c*) Profits.

Layout of Farms.—General survey of land, layout of fields, roads, buildings, irrigation and drainage channel ; fencing.

Farm Labour—Its organisation ; allotment of duties ; training of unskilled labour ; methods of increasing efficiency.

Farm Live-stock and Machinery.—Care, upkeep, and efficiency, distribution according to purposes.

Farm buildings—General principles of layout and construction.

Farm records.—Their maintenance : working out of cost.

Farm Book-keeping—

Necessity of a system of accounts ; classification of accounts ; single-entry—its shortcomings and conversion into double-entry ; principles of the double-entry system and their application.

Forms and uses of cash books ; Purchases and sales books (including columnar books) ; Journal and Ledger ; Opening, costing and closing ledger accounts ; drawing up a trial balance ; Profit and loss account and balance-sheet.

Banks ; bank accounts, bank cheques ; bank reconciliation statements ; discount ; interest ; bad debts ; depreciation and good-will ; bills of exchange and promissory notes ; consignment and joint venture ; reserve and sinking funds.

Preparation of trading, profit and loss accounts and balance-sheet ; provision for discounts and doubtful debts ; suspense accounts ; crop accounts ; labour accounts ; and analysis of wages ; closing up farm and dairy accounts.

Estate Management.—Laws regulating the relations of Government, landlords and tenants ; general description of the estates in the United Provinces ; organisation of staff and their duties.

(3) AGRICULTURAL ENGINEERING.

Farm machinery.—Machines used in cultivation and other operations on the farm ; Comparison of indigenous and imported implements of tillage ; Reasons for variation in nature and strength of material in different parts of the machine ; Wear and tear and how to avoid it ; Mal-adjustments and their correction ; Replacement of parts ; Depreciation and costs.

Irrigation appliances and machinery.—Hand and power lifts ; Calculation of efficiency ; Losses by friction ; well boring ; costs ; Discharge of water from irrigation appliances.

Sources of power on the farm : Comparison of the relative merits of the following :—

Electricity ; steam, internal combustion, water power ; cost of working and comparison with bullock and hand power.

Application of the above forms of power to the following :—

Traction, cane-crushing, sugar plant, threshing, chaff-cutting, flour-milling, water-lifting.

Buildings —Materials used ; Strength and properties of materials ; Stresses and strains ; Tension ; Compression ; shearing tortion ; Factors of safety ; Retaining walls and arches ; Plans, elevations and sections.

Depreciation on all forms of farm machinery and buildings ; Cost of maintenance, both when idle and at work.

Surveying.—Instruments used in surveying. Surveyor's field-book.

Paper III.—*Agricultural Economics and Statistics ; Commercial Farming.*

1. Agricultural Economics.

Introduction and scope of the subject.

Land.—Choice, location and valuation ; large and small farms, marginal land.

Labour.—Factors affecting supply and demand ; organisation of labour ; classification of labour ; efficiency how increased or decreased. Wages ; factors affecting economic cost of labour ; Indian rural labour ; periods of idleness and how best utilised. General agricultural labour problems.

Capital.—Sources of capital ; interest and depreciation ; the present day trend of application of capital to agriculture ; methods of increasing productiveness of capital to agriculture ; rural indebtedness. The Taqavi system—Government loans and grants.

Proportions of the factors of production and laws of return.

Distribution of wealth.—Rent, wages, profits, and interest, their relation to each other.

Exchange.—Markets and marketing, methods of exchange in local, provincial and international markets.

Co-operation in Agriculture.—Forms of co-operation, credit and non-credit ; co-operative purchase and sale, co-operative production ; Application of the principles of co-operation to estates ; Land banks and the application of western co-operative methods to Indian conditions.

2. AGRICULTURAL STATISTICS.

Scope and utility of Statistics.—Compilation and tabulation of data ; averages ; dispersion ; Graphic method ; Diagrams ; Accuracy, Index numbers ; Co-relations.

The study of the above to be based on the following data from the United Provinces and India :—

Acreage under crops ; Average yield of crops ; Irrigated area ; Area under improved varieties ; Spread of improved seed ; Cattle ; meteorological conditions ; Exports and imports.

3 COMMERCIAL FARMING.

Principles underlying commercial farming with major occupation of—

(*a*) Crop Production,
(*b*) Cattle Breeding, and
(*c*) Dairy Farming,

capital outlay ; requirements of capital for recurring expenses ; effects of distance from market ; transport arrangements ; disposal of produce ; practice in working out capital requirements for commercial farms under various conditions in the province, methods of economizing expenditure ; simple systems of accounts for untrained managers.

Practical II—Farm management.

(*a*) Working of improved implements and machinery, their cost, and working expenditure.
(*b*) Survey and layout of farms for—
  (1) Experiments ;
  (2) Demonstrations ;
  (3) Profit.
(*c*) Layout of—
  (1) Orchards ;
  (2) Public gardens.
(*d*) Methods of marketing.
(*e*) The students will visit the following :—
  (1) Holdings of the cultivators ;
  (2) Government and private farms and gardens ;
  (3) Factories utilising agricultural products ;
  (4) Centres of allied industries :
  (5) Markets for agricultural products and requirements.
(*f*) The following record will be maintained by the students to be produced at the final examination :—

(1) The record of the implements and machinery used.

(2) Reports on the places visited.

Paper IV.—*Dairying and Animal Husbandry ; Veterinary Science.*

(1) DAIRYING AND ANIMAL HUSBANDRY.

The object of this course is to deal with the dairyman's aspect of the course rather than the chemists.

(1) Milk and its products :—

Milk : its constituents, food value of milk ; Secretion of milk in the udder ; Factors influencing the quality and quantity of milk produced ; Adulteration of milk and how to detect it.

Production of clean milk, including cost per unit ; Grading of milk ; Treatment of milk for marketing, such as standardizing, pasteurising, homogenising, sterilizing and bottling. Humanizing of milk ; Conveyance of milk and distribution ; Bacterial and legal standards of milk : Milk contracts ; Problems of milk supply in our cities.

Vitamins in milk ; Milk enzymes : contamination of milk and cream ; Milk fermentations , growth of micro-organisms in milk.

Cream : its composition ; Different methods of obtaining cream, such as shallow and deep pan system, water dilution system and centrifugal system ; Efficiency of cream separators : Varieties of separators : The separator bowl, speed of the bowls : separating temperature ; Factors affecting the percentage of fat in cream. The causes of vibration of the separator ; The essentials for successful separation : Advantages of creaming by a separator over the gravity system.

Ripening of cream : Object of ripening ; Ripening temperatures, natural cream ripening : Starters, natural starters, pure culture starters, ripening cream with starters.

Neutralisation of cream for butter-making ; importance of neutralization of cream for butter-making ; The preparation and use of lime as a neutralizer.

Butter : its composition, making of butter from ripened cream, sweet cream and whole-milk : Points of good butter : Judging of butter : Estimation of water in butter.

Ghee : manufacturing ghee from (*a*) cream and (*b*) butter ; comparison with the indigenous method.

Cheese: Quality of milk for cheese; Varieties of Indian cheese, such as—

(*a*) Milk cheese, and
(*b*) Cream cheese.

Manufacture and uses of milk-sugar, milk powder and condensed milk, and casein composition and uses of separated milk, butter-milk and whey: Comparison of profits by sale of daily produce such as whole milk, cream, butter, ghee and cheese.

(2) Refrigeration of dairy products: and construction of cold-store.

(*a*) Refrigeration of dairy products: Importance of refrigeration: the two systems of refrigeration *i. e.*, Natural and Mechanical: Natural system, including ice-bunker method, insulated ice-house method and gravity brine method. Mechanical system: Its history: Principle involved, different ways of effecting refrigeration by the comparison system, such as the brine circulation system, the direct expansion system and the cold air-blast system.

(*b*) Construction of cold-store:—Location of cold-store in the dairy, material required, size, construction of floor, walls, roof, door and windows · Ventilation and painting.

(3) Dairy utensils and Machinery:—

Utensils and machinery of the cow-shed, the yard and the butter-house: Minimum requirements of a dairy in utensils and machinery: Cost and upkeep: Power requirements; Steam and electricity for dairy purpose.

(4) Live-Stock:—

(*a*) Judging of cows, bulls, bullocks and young stock: Systems of establishing and maintaining the herd; Study of important breeds of cattle of the whole of India; The cattle breeding problem and how to improve it: Comparison of important breeds of exotic and indigenous cattle, results achieved with important breeds of improved stock: Improvement of sheep in India.

(*b*) Animal Breeding:—Aims of the breeder, selection, systems of breeding such as guarding,

crossing, line-breeding and in-breeding ; Variation : kind of variation, such as morphological, functional and mutational : The Mendelian rule as applied to cattle improvement : Pedigree, heredity and prepotency of farm animals.

(c) General management ; Selection, care and management of the sire ; Raising of dairy calves ; marking of calves for identification ; Dehorning ; Raising of the dairy heifer, care and management of milch stock, such as housing, regularity and gentleness in handling, exercise and grooming, watering, milking, supplying mineral matter, giving the cow a rest ; drying off the cow, mating, breeding or condemnation ; Introduction of new animals into the herd.

(5) Feeds and Feeding :—

The digestion of feeds . The determination of digestibility of food-stuffs ; Relative values of feeding stuffs ; The production values of feeding stuff ; Kellner's starch values, Computation of rations for maintenance, growth and production of milk and other utilities by well-known feeding standards, including Armsby, Kellner, Wolf-Lehman and Hæcker ; Recent work on feeding standards in India ; Feeding of weaned calves, Pregnant cows and cows just calved.

Feeding stuffs and their classification, mixing of rations ; care in handling and preparation of rations, Hay-making, silage making and soiling system.

(6) Farm buildings :—

Location of farm buildings ; Grouping of the different farm buildings, such as dairy-milking-sheds, milk-recording room, shed for calves, dry and young stock sheds, calving-shed, bull-sheds, godown, silo-tower, implement-shed, chaffing-shed, water trough, isolation yard and menials' quarters.

(*a*) Dairy building—amount of floor space ; Arrangement of floor space ; Construction of foundation, walls and roofs ; Ventilation, cost per sq. ft.

(*b*) Milking shed—importance of good milking-shed, different types of sheds, space requir-

ed per head of cattle ; construction of floor, feeding troughs, gutters, walls and roof ; Ventilation and requirements, in air and light ; Ties, stanchions and partitions.

(*c*) Construction of other buildings such as milk recording room ; Shed for calves ; Dry and young stock sheds ; Calving boxes ; Bull sheds ; Godown ; Silo tower ; Implement shed ; Chaffing shed ; water trough ; Isolation yard and menials' quarters, cost per sq. ft.

(7) Dairy Farm Management :—

Labour requirements in the care of cattle ; Causes of loss of time in dairy routine work and their effect on production ; Efficiency of labour in the dairy ; Cropping scheme for the supply of green fodder to the dairy cattle all the year round ; Study of cattle and dairy registers.

(8) General :—

Capital and recurring cost of cattle-breeding scheme. Schemes for starting dairy farms with main purposes of—

(*a*) Milk Production.
(*b*) Butter Production.
(*c*) Cheese Production.

(2) VETERINARY SCIENCE.

(1) (*a*) Elementary physiology of cow, ox, and horse ; their requirements, in food and water.

(*b*) Stables—Their construction and hygiene for sick and pregnant animals : Ventilation ; Drainage.

(*c*) Infectious and contagious diseases—Their cause and mode of dissemination. General measures for prevention, Immunity and Idiosyncracy.

(*d*) Description, Symptoms, Diagnosis and Treatment of the following diseases of cattle :—

(1) Anthrax, (2) Foot and mouth diseases, (3) Haemorrhagic septicaemia, (4) Rinderpest, (5) Black quarter, (6) Cow Pox, (7) Tick fever, (8) Rheumatism, (9) Tympanitis, (10) Impaction of rumen, (11) Indigestion, (12) Gastritis, (13) Diarrhoea, (14) Pneumonia, (15) Tuberculosis, (16) Simple ailments, (17) Pleuro-pneumonia contagiosa, (18) John's disease, (19) Coccidiosis, (20)

White scour, (21) Glanders, (22) Ephemeral fever, (23) Diseases of udder and teats, sterility.

(*e*) Simple obstetrics; Common forms of abnormal parturition; Treatment of diseases accompanying parturition; *e. g.* retention of placenta, milk fever, parturient paralysis; metritis and prolapse uteri, etc. Treatment of diseases of new born calf.

(*f*) Poisons commonly used to destroy cattle; their symptoms and treatment.

(*g*) First-aid in cases of injury; treatment of simple wounds, sores and tumours.

(*h*) Biological products and their uses.

(*i*) Causes, symptoms and treatment of skin diseases and internal and external parasites.

2. Animal Breeding.

Aims of the breeder, selection, system of breeding, such as grading, crossing, live-breeding and in-breeding: variation, kind of variation such as morphological, functional and mutational. The Mendelian rule as applied to cattle improvement; pedigree, heredity, prepotency of farm animals.

Practical III.

(1) Dairying and Animal husbandry.

1. Grooming of calves, milch cows and other dairy cattle.
2. Artificial feeding of young calves which have been weaned.
3. Mixing of feeds and preparing balanced rations for dairy cows and other cattle.
4. Approaching and handling of the different dairy cattle.
5. Judging of dairy cows, heifers, bulls and bullocks by means of the score card system.
6. Purchasing of dairy cattle in the market.
7. Branding of young stock and adults.
8. Dehorning of young calves.
9. Handling and care of the bull.
10. Hygienic milking of cows and buffaloes.
11. Recording of milk.
12. Sampling of milk.

13. Cleaning of dairy utensils.

14. Preparation of churn, butter-worker and other such appliances.

15. Tests in milk and cream—

(*a*) Fat percentage by Gerber's method.

(*b*) Specific gravity by means of lactometer.

(*c*) Solids-not-fat with the help of formula after noting the fat per cent and specific gravity.

(*d*) Total solids both by evaporating the milk and with the help of Richmond's milk scale.

16. Detection of adulteration in milk.

(*a*) Extraction of fat.

(*b*) Addition of water.

(*c*) Addition of separated milk or a combination of any of these.

17. The detection of stale or dirty milk.

18. Testing acidity of milk and cream.

19. Standardizing of milk.

20. Humanizing of milk.

21. Pasteurizing of milk.

22. Bottling of milk.

23. Sealing of milk bottles and cans.

24. Fitting and adjusting of cream-separators.

25. Separating of milk.

26. Preparation of mother starter.

27. Neutralization of cream.

28. Natural cream ripening and ripening with the help of starters.

29. Butter making.

30. Judging of butter.

31. Packing of butter for the market.

32. Estimation of water in butter.

33. Casein making :—

(*a*) Commercial casein.

(*b*) Rennet casein.

(*c*) Lactic casein.

34. Ghee-making from—

(*a*) Curd or Dahi as practised in villages.

(*b*) Cream, and

(*c*) Butter.

35. Study of different dairy and cattle registers.

(2) VETERINARY SCIENCE.

(1) Dissection and practical acquaintance with the external and internal anatomy of cattle.

(2) Common external and internal parasites of cattle and methods of their eradication, disinfection of stables etc.

(3) Familiarity with common medicines, their actions, dosage and handling. Drenching.

(4) Simple surgery and bandaging. Preparation of ointments, medicated oils, liniments and dispensing of prescriptions.

(5) Care, management and clinical study of sick animals.

(6) Care of expectant mother before and after calving and handling of new-born calves.

(7) Diagnosis of ordinary and common ailments and diseases and their treatment. Study of sprains of muscles, ligaments and tendons and their treatment.

(8) Throwing the animal : Castration : shoeing.

(9) Treatment of abscesses, wounds, tumours and fractures.

Students will visit dairies and maintain record of laboratory work and outdoor observations to be produced at the final examination.

Paper V.—*Pests, Diseases and Common Weeds.*

(1) Common Insect Pests of the United Provinces and their control.

(*a*) The life-history and development of two typical insects, namely grass-hopper and butterfly.

(*b*) Insects and agriculture.

The nature and extent of damage. Leaf eaters ; Stem and root borers ; Root eaters ; Flower and fruit eaters ; Fruit borers ; Sap suckers : Blood suckers ; Eaters of stored grain. Transmission of diseases of cultivated plants and animals.

(*c*) Methods of control :—

(*i*) Biological control :—Resistance and immunity, need for combining host resistance factors ; in plant breeding, Bacterial, Protozoan and fungoid diseases of insects and their use in pest control. Insect

predators and parasites and their utilisation.

(*ii*) Cultural Control :—Value of clean cultivation ; Good tilth ; manuring ; irrigation and draining ; Rotation ; Resistant varieties, Alteration of seasonal dates and use of trap crops.

(*iii*) Mechanical and physical methods :—Collection of eggs, larvae and adults ; Cutting out dead hearts ; Barriers ; Grease bands ; Shelter traps ; Cleaning of stored grain ; Light traps ; Scent traps ; Sun or machine heating of seed ; Destruction of attacked fruits.

(*iv*) Chemical control :—Insecticides ; their preparation and employment ; Contact and stomach poisons ; Apparatus for application ; Fumigation Insectifuges and repellants.

(*d*) The occurrence, life histories, attack and methods of control of the following pests :

Orthoptera—Khariff grass-hoppers (Hieroglyphus sp)

Hemiptera—Mustard bug (Bagrada picta) ; Ricegandhi (Leptocorisa vericornis) ; Red cotton stainer (Dysdercus cingulatus) ; Sugarcane leaf-hopper (Pyrilla sp.) ; Mango Leaf-hopper (Idiocerus sp.) ; Sugarcane white fly (Aleurolobus barodensis) ; Mustard green fly (Aphis brassicae) ; Mango white bug (Monophlebus sp.)

Lepidoptera :—Gram caterpillar (Chloridea obsoleta) ; Cut Worm (Agrotis pypsilon) ; Cotton spotted boll worm (Earias sp.) ; Sugarcane stem borer (Diatroea sp.) ; Sugarcane root borer (Emmalocera depressella) ; Sugarcane top borer (Scripophaga nivella) ; Maize and Juar borer (Chilo zonellus) ; Cotton leaf roller (Sylepta derogata) ; Cotton Pink boll-worm (Platyedra gossypiella) ; Potato moth (Phthorimoea operculella) ; Grain and flower moth (Sitotroga cerealella).

Coleoptera.—Wheat weevil (Calandra oryzæ) ; Pumpkin beetle (Aulacophora abdominalis).

Isoptera.—White ants (Termitidæ).

Diptera.—Fruit and pumpkin flies (Dacus sp.)

(2) (*a*) Elementary study and acquaintance with the common Fungus and Bacterial diseases of U. P., namely—
(1) White rust of Cruciferae.
(2) Downy mildew of *sarson*.
(3) Black, green and blue moulds.
(4) Powdery mildew of peas.
(5) Smut of *jowar*, *bajra*, wheat and sugarcane.
(6) Rust of wheat and linseed.
(7) Wilt of *arhar* and cotton.
(8) Red-rot of sugarcane.
(9) Canker of citrus.
(*b*) Knowledge of control methods generally.
(3) Common Weeds of the U. P. and their control.
(*a*) Distribution of common weeds in the locality; their injurious effects. Habits of growth and methods of prevention and eradication.
(*b*) Detailed study of—
(1) Zizyphus rotundifolia.
(2) Corchorus acutangularis.
(3) Desmodium triflorum.
(4) Convolvulus arvensis.
(5) Convolvulus microphyllus.
(6) Euphorbia hirta.
(7) Euphorbia thymifolia.
(8) Asphodelus tenuifolius.
(9) Cyperus rotundus.
(10) Setaria glauca.
(11) Saccharum spontaneum.
(12) Digitaria sanguinalis.
(13) Andropogon sp.

Practical IV

(1) Acquaintance in field and laboratory with twenty-four insect pests and their life-histories. Field application of control measures, including preparation and application of standard insecticides.

(2) General knowledge of control operation for Common Fungus and Bacterial diseases.

(3) Methods of prevention and eradication of Common Weeds.

The course will be studied entirely from a farmer's point of view. His interest will dominate over the scientific aspect of the study.

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AGRICULTURAL CHEMISTRY.

Paper I.

Historical.

History treated in a brief manner with especial reference to the development of ideas in plant nutrition and relation of plant to soil.

The Soil.

Elementary geology necessary for the study of soils. Formation of soil. Constitution of soil. Chemical and Physical properties of soil. Soil reactions. The Colloidal properties of soil. Soil conditions affecting plant growth. The Elementary principles of soil microbiology. Methods of sampling soils. Mechanical and chemical analysis, and interpretation of results. The carbon and nitrogen cycles in the soil Base exchange. Causes of fertility and sterility of soils. Composition of drainage and irrigation waters Climate and its influence on soils. Methods of soil classification. Soil types with especial reference to the soils of United Provinces.

Methods of soil survey. Soil erosion. Reclamation and improvement of soils.

Fertilizers and Manures.

Classification of fertilisers and manures. Sources, manufacture and properties of the chief fertilisers and manures.

Farm yard manure and its storage. The relation of manure to crops. Law of Diminishing Returns. Analysis and valuation of manures.

The Plant.

Composition of plants and their products. Assimilation of food, its products and their transformation. Chemical changes during germination, growth and ripening. Enzymes. Factors affecting the growth of plants.

Paper II.

Feeding stuffs.

Chemistry of constituents of feeding stuffs :—

Carbohydrates, including sugars, starches, fibres and glucosides. Proteins, polypeptides and amino acids. Fats and oils. Benzene, phenol, salicylic acid, tannin, terpenes resins, nicotine, morphine, quinine and glucosides. Vita-

mins. Classification and composition of feeding stuffs. Methods of analysis and interpretation of results.

Animal Nutrition.

The chief constituents of the animal body. Digestion, absorption and metabolism. Maintenance and production. Growth, milk production, meat production, and work. Functions of various nutrients in the body and their relative importance for growth, maintenance and repair. Adoption of food to requirements of animals under different conditions of life. Study of stuffs and feeding standards ; starch equivalent and albuminoid ratio.

The Dairy.

The constituents of milk and their relative amounts. Composition of dairy by—products, *viz*, skimmed milk, butter milk, *dahi* and whey. Vegetable Ghee. Chemical changes in the storage of milk, butter, cream and ghee. Preservatives and standards. Adulterants and substitutes.

PRACTICAL.

Qualitative analysis of a mixture containing not more than two positive and two negative ions from among the following:—

POSITIVE:—Ag, Pb, Hg. (ous), Cu, Hg. (ic), As, Fe, Al, Cr, Mn, Zn, Ba, Ca, Mg, Na, K, NH_4; Negative: Cl, Br, I, NO_3, NO_2, SO_4, S, CO_3, PO_4, BO_3.

Volumetric estimation of Ferrous iron by $KMnO_4$ and $K_2Cr_2O_7$ methods ; chlorine as AgCl in soluble chlorides ; calcium by precipitation as oxalate and then permanganate method.

Gravimetric estimation of calcium, iron, aluminium, chloride and sulphate.

Estimation of nitrogen, ammonia, nitrate and phosphoric acid.

Soil analysis.

Ph. value determination. Mechanical analysis. Estimation of phosphoric acid, potash and lime in HCl extract ; calcium carbonate and lime requirement ; potash and phosphoric acid soluble in one per cent. citric acid ; ammoniacal and nitrate nitrogen.

Examination of drainage and irrigation water.

Analysis of common manure and fertilizers for nitrogen and phosphoric acid, both total and available. Detection of impurities and adulterants.

Qualitative examination and recognition of proteins, carbo-hydrates and fats. Estimation of water, ash, sand, protein, fibre and sugars in feeding stuffs.

Qualitative and quantitative analysis of dairy products and their substitutes. Determination of acidity in milk. Fats, total solids and specific gravity of milk. Water, salt and volatile acids in butter.

BOTANY WITH PLANT PATHOLOGY.

Paper I.—*Botany.*

Reproduction.—Vegetative reproduction; Sexual reproduction; Cross and self-pollination; Mendel's laws; Hybridization process.

Systematic botany with special reference to Agricultural Plants, Fruit Trees and Common Weeds:—

Anonaceæ; Papavaraceæ; Cruciferæ; Malvaceæ; Linaceæ; Rutaceæ; Anacardiaceæ; Leguminosæ; Rosaceaæ; Cucuobitaceæ; Umbelliferæ; Compositæ; Convolvulaceæ; Solanaceæ; Scrophulariaceæ; Pedaliaceæ, Acanthaceæ; Labiatæ; Amarantaceæ; Euphorbiaceæ, Urticaceæ; Scitaminoæ; Lilliaceæ; Gramineæ.

General acquaintance with methods of preparation of botanical specimens and permanent glycerine slides.

Seeds: Identification of seeds of common crops and weeds; their purity and germinating capacity.

Practical.

The practical work will be based on and co-ordinated with the theoretical course.

Note-books containing a complete record of laboratory work will be required to be produced at the Practical Examination.

Paper II.—*Plant Pathology.*

I. Mycology.

Study of the life-history of the following:—

Pythium; Albugo; Sclerospora; Peronospora; Phytophthora; Mucor.

Saccharomyces ; Peziza ; Nectria ; Clavicеps ; Xylaria.
Erysiphe ; Phyllactinia ; Meliola ; Penicillium ; Aspergillus.
Ustilago ; Puccinia ; Melampsora.
Agaricus.
Botrytis ; Glœosporium : Colletotrichum ; Fusarium.
Alternaria ; Helminthosporium.

II. Bacteriology.

Bacteria in general, including role of bacteria in nature. Morphology and classification of bacteria : Physiology of bacteria (Elementary treatment) ; Asepsis and Antisepsis ; Sterilization.

III. Diseases of Plants.

Causes of diseases :—

(*a*) Parasitic—
(*i*) Mycological.
(*ii*) Bacterial.
(*iii*) Phanerogamic.
(*b*) Virus.
(*c*) Physiological.

Saprophytism and parasitism, symbiosis ; Specialization of parasitism ; Methods of infection.

Principles of Control.

IV. Study of the following diseases and their control :—

(*a*) Parasitic—

(*i*) Mycological—Symptomatology ; Identification of the causal organism.

Stem rot of papaya (Pythium) ; White rust (Cystopus) ; late Blight (Phytophthora) ; Downy mildew (Peronospora) ; Green ear disease (Sclerospora) ; Ergot (Claviceps) ; Powdery mildew (Erysiphe, Phyllactinia) ; Soft rot (Penicillum, Aspergillus) ; Sooty mould (Meliola) ; Smuts (Ustilago) ; Rusts (Puccinia, Melamspora) ; Early blight of potato (Alternaria) ; Red-rot of Sugarcane and Anthracnoses (Colletotrichum) ; Wilt (Fusarium ; Rhizoctonia) ; Leaf spot (Helminthosporium) ; Lichens.

(*ii*) Bacterial :—

General character of the causal organism of—
Soft rot of vegetables ; Citrus canker.

(*iii*) Phanerogamic :—
Cuscuta ; Loranthus ; Orobanche.

(*b*) Virus—
Leaf roll and Mosaic of potato.
Mosaic of tobacco and sugarcane.

(*c*) Physiological—
Chlorosis.

Practical.

The practical work will be based on and co-ordinated with the theoretical course.

In Bacteriology practical, the students should be familiar with—

(*a*) The preparation of culture media, namely Bouillon, glucose, milk and potato.

(*b*) Microscopic examination of bacteria ; Use of oil immersion lens ; Staining of bacteria ; Measuring of bacteria ; Gram's method of staining ; Demonstration of the spores of bacteria.

(*c*) Methods of identification of bacteria in outline.

Isolation culture and examination of B. Subtilis. Counting bacterial colonies in Soils and milk by plate culture method.

Note-books containing a complete record of laboratory work will be required to be produced at the Practical Examination.

BOTANY WITH PLANT BREEDING.

Paper I.—*Botany.*

(*Same* as under Botany with Plant Pathology.)

Paper II.—*Plant Breeding.*

Study of reproductive organs and modes of fertilization, artificial and natural.

Historical survey of plant breeding work ; Nature and scope of breeding work in the United Provinces.

Variation : Nature, amount, causes and kinds ; Fluctuating variability and Mutation.

Measurements of variations.

Fertilization process ; hybridisation, its limits and technique. The inheritance of morphological and physiological characters of plants.

Theories of Evolution.

Mendelism and its bearing on plant-breeding.

Selection ; Fixation of new forms ; Mass culture and pure lines.

Practical.

Students will be required to be familiar with the hybridisation technique, lay out of replications, numbering, labelling and recording for breeding purposes.

BOTANY WITH HORTICULTURE.

Paper I.—*Botany.*

(*Same* as under Botany with Plant Pathology.)

Paper II.—*Horticulture.*

1. *Introduction.*

(*a*) Horticulture as an industry and its survey in general.

(*b*) Principles of manures and manuring, irrigation and drainage with special reference to horticultural practices.

2. *Fruit Gardening.*

(*a*) Location and layout of orchards.

Selection of sites with reference to area, topography, soil and climatic conditions.

(*b*) Cultivation, planting and propagation.

Preparatory tillage. Different systems of planting, training, pruning and intercropping. Types of windbreaks and their effects on orchards. Protection of trees from frost and sunburn.

Propagation by seeds, cuttings, eyes or single buds, leaves, layering, gootee or marcottage. Budding and grafting of various types. Advantages and disadvantages of vegetative method of reproduction.

(*c*) Nursery practices.

Maintenance of nursery and care of nursery stock.

Method of packing and transport of nursery stock.

(*d*) Bearing habits in fruit trees. Causes of failure of crops and their treatment.

(*e*) Harvesting and marketing.

Principles and practices of harvesting, grading, packing, storing, transporting and marketing of fruits.

(*f*) Preservation of fruits and vegetables.

Necessity for preservation of fruits and vegetables. Elementary treatment of principles and methods of preservation. Importance of cold storage with special reference to fruits and vegetables.

Fruit crops.

Mango. citrus and its varieties, guava, grape, banana, papaya, loquat, lichi, ber (Ziziphus jujuba), apple, peach, apricot, pear.

3. *Vegetable gardening.*

(*a* Types of vegetable gardening.

Market and kitchen gardening.

(*b*) Selection of sites and layout.

Rotation, intercropoing and companion cropping.

(*c*) Harvesting and marketing.

Stages at which crops should be harvested, special preparation. Storing and marketing. Raising and preservation of seeds.

Crops.

Leaf crop—Lettuce, Palak.
Cole crops—Cabbage, Cauliflower, Knol Khol.
Root crops—Radish, turnip.
Bulb crops—Onion, garlic.
Legume—Pea, bean.
Cucurbitaceous Crops—Cucumber, petha.
Solanaceous crops—Tomato, brinjal and chillies.
Miscellaneous crops—Bhindi, Colocasia, Parwal.
Spices—Ginger, Turmeric, Dhania, Zira, Pudina.

4. *Ornamental gardening.*

(*a*) History and progress of garden planning.

Various styles in gardening :—The formal, the landscape (informal or natural) and the mixed style.

(*b*) Selection of site and layout, including simple designs.

(*c*) Use of common ornamental and flowering trees, shrubs, climbers and annuals; common plants used for making hedges and edges, herbaceous shrubbery, borders and rockery,

(*d*) Lawns—Their making and maintenance.

(*e*) Garden decoration and garden furniture.

Practical.

1. Practical acquaintance into the methods for propagation of all classes of plants included in the above course will be required.
2. Students should be well acquainted with the common cultural operations practised in orchards, vegetable gardens and ornamental gardens and should show a certain amount of efficiency in their practices.
3. They should be able to prepare simple plans for gardens and execute designs.
4. They should be able to indentify and name the common edging plants, hedge plants, creepers flowering and ornamental trees and shrubs, summer and winter annual flowering plants growing in the botanical garden.
5. The students will be required to know the use of different garden tools and implements.
6. Practical acquaintance with the methods of fruit preservation, transformation and canning.

Records of observations of the individual students of field and laboratory work shall be required to be produced at the examination.

ZOOLOGY WITH PARASITOLOGY AND ENTOMOLOGY.

Paper I.—*Zoology and Parasitology.*

(1) The general principles of Biology, treated in an elementary manner, including the theory of evolution.

(2) The structure and phenomena of the animal cell. Reproduction, sexual and asexual: Parthenogenesis; Metamorphosis, Alternation of Generations.

(3) Principles of classification; Special reference to Phyla containing animals of economic importance to agriculturists.

The general features, biology and economic importance of the following phyla and examples :—

Non-Chordata.

Phylum.	Class.	Example.
Protozoa ...	Rhizopoda	... Amœba.
	Sporozoa	. Malarial parasite.
	Infusoria	... Paramœcium.
Cœlenterata ...	Hydrozoa	... Hydra.
Platyhelminthes	Trematoda	... Fasciola hepatica.
	Cestoda	... Tænia.
Nemathelminthes	Nematoda	... Ascaris.
Annelida ..	Chætopoda	... Pheretima.
Arthropoda ...	Crustacea	... Prawn (Appendages only).
	Insecta	... Grasshopper.
	Myriapoda	... Centipede, Millipede.
	Arachnida	... Scorpion, Mite, Tick
Mollusca ...	Gastropoda	... Pond Snail Pila.
	Pelecypoda	... Fresh-water Mussel, Unio

Chordata.

Craniata ...	Pisces	... Scoliodon. Labeo sp. (Rohu) (External features only).
	Amphibia	... Frog.
	Reptilia	... Lizard. Poisonous snakes of India. (Recognition only)
	Aves	... Pigeon (excluding skeleton). Common fowl (skeleton only).
Mammalia	... Distinction between orders Ungulata, Carnivora, Rodentia, Insectivora, Chiroptera, Primates, Squirrel or rat.	

(4) The outlines of the development of frog, chick and rabbit. Amnion and Allantois, Placentation.

Parasitology.

The identification, biology and economic status of parasitic and pathogenic species of Protozoa, Platyelminthes, Nemathelminthes and Arachnida.

Phylum.	Class.	Example.
Protozoa	... Rhizopoda	... Amœbæ.
	Mastigophora	... Trypanosoma.
	Infusoria	... Balantidium.
	Sporozoa	... Babesia.
Playtyhelminthes	Trematoda	... Fasciola hepatica.
		Schistogomum bovis.
	Cestoda	... Tænia Saginata.
		,, Magrinata
		,, Crassicollis.
		,, Echinococcus.
Nemathelminthes	Nematoda	... Tylenchus.
		Heterodera.
		Ascaris.
		Anchylostoma.
		Filaria.
		Strongylus.
Annelida	... Hirudinea	... Hirudo.
Arthropoda	... Arachnid	... Fowl-mite, Ticks.

Practical.

Identification of example. Laboratory acquaintance with their general characters. Elementary laboratory technique. Examination of guts and excreta for parasites and eggs.

Paper II.—*Entomology.*

Entomology.

Biology and Taxonomy.

Insect structure and development as seen in grasshopper and butterfly; embryology; post embryonic development, metamorphosis; the exoskeleton; segmentation; the limbs; mouth parts, other appendages; wings and venation; digestive system; circulatory system: respiration; excretion; nervous system; sense organs; reproductive organs; Classification: the orders of insects.

Economic Entomology.

Orders and families of economic importance, classification, identification, life-histories, food plants, and economic status of major pest insects of the United Provinces, pest of stored products, and insects of commercial value.

Natural control.

The balance of nature ; Climate ; disease ; parasites and predators. Artificial control.

Biological control.

Utilisation of diseases, parasites and predators; cultural control ; susceptibility and resistance.

Chemical and Physical control.

Insecticides and fumigants ; preparation, uses, limitations and apparatus for application ; heat sterilization, crop storage.

Crop pests—

The pests of the following crops in Northern India, and application of suitable control measures :—

(1) Cereals	...	Wheat, barley, rice, *juar*, *bajra*, and maize.
(2) Fibres	...	Cotton, Sannhemp, patsunn.
(3) Oilseeds	...	Castor, linseed, mustard.
(4) Legumes	...	Peas, groundnuts, *arhar*, gram.
(5) Fodders	...	*Juar*, lucerne, *guar*, oats.
(6) Miscellaneous crops.	..	Sugar-cane, tobacco.
(7) Cole crops	...	Cabbage, knol-khol, cauliflower.
(8) Roots	...	Carrots, beetroot, turnip.
(9) Bulbs	...	Onion, garlic
(10) Tubers	..	Potato, sweet potato.
(11) Cucurbitaceous crops.	...	Cucumber, *torai*, melons, pumkins and gourds.
(12) Miscellaneous vegetables.	... ...	Turmeric, ginger, tomato, brinjal, *bhindi*, chillies.

Beneficial insects of commercial value : Silk worms, bees, and lac insects.

Practical.

Field and laboratory acquaintance with local pests : breeding and record of the life-histories.

Collection of insects, pinning, setting and classification.

Application of control methods in field and store, including preparation and use of insecticides.

ZOOLOGY WITH PARASITOLOGY AND ANIMAL BREEDING.

Paper I.—*Zoology with Parasitology*

(*Same* as under Zoology with Parasitology and Entomology).

Paper II.—*Animal Breeding.*

1. Anatomy and Cytology of Reproduction :

Reprodctive organs of fowl, rabbit, goat and cattle ; their anatomy and function ; Histology and cytology of germs cells, Chromosomes. Mechanism of maturation and fusion of sex cells

2. Theories and mechanism of inheritance :

Variation, Natural selection, Adaptation, Origin of species, Definition of species. Varieties. Mutations. Domestication. Artificial selection : reversion.

Breeds and pedigrees.

Mendelian rules of heredity : Interpretation of chromosome behaviour ; their function inheritance of characters ; linkage of characters ; sex-linkage ; sex determination.

Galton's theory. Bruce-Low system of breeding. Lines and families. In-breeding. Out-crossing. Cross-breeding.

3. Procreation and Development :

Fertilisation. The embryo. Outlines of embryonic development of chick and rabbit. The foetus. Gestation. Parturition. Post-natal development and nourishment. Provision of milk in mammals.

4. Objects and aims of breeding. Poultry for eggs, table or general utility. Rabbits for table, fur, *pelts*. Sheep for meat, wool. Goats for milk, meat, draught. Pigs for meat, bristles. Horses for strength, speed, draught, riding. Cattle and buffaloes for milk, work.

5. Typical breeds of domestic animals and their characterstics.

Poultry (Fowls, Ducks, Geese, Turkeys, Guinea-fowl). Rabbit. Sheep. Goats. Pigs. Horses, Asses and Mules. Cattle. Buffaloes. Camels. Elephants.

6. Principles and practice of breeding :

Selection and fixation of breed. Maintenance of purity, improvement within breed. Application of Mendelian laws and Bruce-Law system. Pedigrees ; stock

registers. Inbreeding and out-crossing in practice. Cross-breeding for utility and for combination of characters for permanent fixation.

7. Breeding for Indian requirements :

The characterstics of selected breeds of domestic animals with special reference to Indian conditions and requirements. Consideration of the merits and failings of each breed, with particular attention to breeds of cattle for work and for milk. Selection of stock. Inheritance through sire and dam. Milk and work records. Thriftiness. Weeding out—

Poultry. Sheep. Goats. Pigs Horses. Asses. Mules. Cattle. Buffaloes. Camels.

8. Breeding hygiene :

Care of breeding stock. Mating : Sterility, causes and precautions. Care of pregnant females. Delivery. Care and maintenane of young stock. Common pests and diseases, their prevention and treatment.

9. Stock accounting.

Practical.

Elementary anatomy of reproductive organs. Elementary cytology of oogenesis, spermogenesis. Maturation and fusion of Sex cells. Embryonic and foetal development. Experience of poultry and cattle-breeding and maintenance records and accounts. Visits to poultry, horse and cattle-breeding farms.

Practical work with the college herd, and visits to poultry, horse and cattle-breeding establishments in addition.

RURAL ECONOMICS AND ESTATE MANAGEMENT.

Paper I.—*Rural Economics.*

1. Fabric of rural life, its unitary characters History of growth of village life ; factors contributing to its development or decay. General description of village population, geography, occupations, administration, education, sanitation and similar matters affecting the village.

2. Ways of making a living in the village ; effect of civilization and commercialization on cost and standards of living ; effect of modern system of education ; contact with outside world and its effect : drift to towns ; flow of money remitted from outside. Causes leading to poverty and indebtedness ; fragmentation of holdings, enforced idleness and failure to conserve and utilize rural resources ; social disintegration ; drink and other social evils ; social and religious customs ; caste taboos.

3. Indigenous forms of co-operation as a factor in village life and organisation including arts, crafts and agriculture.

4. The scope of village occupations. Kinds, classes and conditions of farming. Subsidiary occupations such as bee-keeping, poultry, rope and basket-making ; extent to which spare time can be utilised ; possibilities of utilization of mechanical and electrical power.

5. Rural reconstruction difficulties—financial or other. Special problems. Insecurity of life and property, inadequate transport facilities. Comparative lack of amenities.

Paper II.—*Estate Management.*

1. *Land Laws* :—The knowledge of the land revenue and the rent law ; Records of agricultural rights. The history and the present structure of the Zamindari and Tenancy. A general survey of land system in other provinces and countries.

2. *Organization and administration of estates* :—Taluqdari and Zamindari systems. Organization of the estates

in U. P. Staff and their duties, difficulties in collection of revenue and how to meet them; methods of enhancing income; disputes arising out of questions of land and water and revenue and how to deal with them; ways of avoiding unnecessary litigation; easements and other customary rights; proportion of expenditure and income on estates and causes of variation.

3. *Improvements:*—Possibilities of investment of part of income by landlord in land development. Judicious investment of capital for productive purposes such as in sugar machinery, water pumping plants, machinery for eradication of weeds, tractors, improved transport, roads communication; methods by which tenants can be induced to undertake improvements in their holdings; cattle improvement; estate sanitation; advantage of educating tenantry.

4. *Personal Farming and Management of Sir land:*—Acquiring of land by the landlord for his own cultivation and difficulties attending the process; advantages of cultivation by resident landlords as against absent landlords.

PRACTICAL

Part 1.—

Note.—The treatment should be generalised and not specialized.

Study of village life with special emphasis on the following points:—

(1) Acquaintance with the principal factors affecting the gross and net profits of agriculture, cattle-breeding, dairying and subsidiary rural industries.

(2) Acquaintance with the principal elements and their relative ratios in family budgets for the different strata of village society.

(3) Practical acquaintance with problems of marketing.

Part 2.—

Surveying.

Plane chain survey of irregular plots including the use of offsets and calculation of areas in acres; reduction of bearings.

Plane table survey, plotting from surveyor's field-book; of prismatic compass and levels.

(1) Maintenance of Patwars paper and Court of Wards records

(2) Record of visits to Court of Wards and Zamindari Offices.

FIRST M. B., B. S. EXAMINATION, 1941 AND 1942.

The teaching of Anatomy and Physiology should include as a regular part of the courses, the demonstration on the living human body of structure and functions, including the information to be obtained from Radiology.

ANATOMY.

1. Human Anatomy and Embryology with special reference to their application in Medicine and Surgery.
2. Dissection of the whole body at least once

Books recommended :

Cunningham Practical Anatomy.
Cunningham : Text-book of Anatomy.
Gray Text-book of Anatomy.
Siddiqi : Anatomical Atlas of Human Body

Books of Reference :

Berry : Practical Anatomy.
J. Fraser : Osteology.
J. Fraser : Embryology.
Buchanan's Anatomy, edited by J. Fraser.

PHYSIOLOGY.

1. The Physiology of the Blood, of circulation, Respiration, Secretion and Excretion, Digestion and Absorption, Exchange of material and Nutrition, Production and Discharge of Heat and the Maintenance of normal Temperature in the Body
2. The influence of the nervous System on each of the above-named functions.
3. The elementary Physiology of Muscle and Nerve.
4. The Physiological Anatomy of the Brain and Spinal Cord and the localisation of function in these organs.
5. The Physiology of common and special Sensation and the Physiological Anatomy of the Sense Organs.
6. The Physiology of the Larynx : elementary facts relating to Voice and Speech.
7. The Physiology of the Ductless Glands.
8. The Physiological properties of Adrenaline, Atropine, Curare, Histamine, Nicotine, Pilocarpine, Strychnine, Ergotoxine, and Acetylcholine.

9. Bio-Chemistry and Bio-Physics.

The knowledge of Elementary Chemistry and Elementary Physics required before entrance upon the Medical curriculum paper will be supplemented before the First M. B., B. S. by further instruction and examination in these subjects adapted to the special needs of a medical student.

10. The elementary Physiology of Anæsthesia

11. The elements of Physiological Psychology.

In the practical examination students will be required to give evidence of their knowledge—

(*i*) by recognizing specimens of normal tissues under the Microscope.

(*ii*) by making preparations of normal tissues, either fresh or previously prepared so as to demonstrate their structure.

(*iii*) by performing with the aid of preparations of the frog, simple experiments relating to the properties of muscles, nerve, and the central nervous system ;

(*iv*) by identifying by simple experiments substances and liquids of physiological importance. Students may also be required to estimate quantitatively the chief constituents of Normal and Pathological Urine.

Books recommended :

Halliburton : Manual of Physiology.
Halliburton : Essentials of Chemical Physiology.
Schafer : Essentials of Histology.
Schafer : Essentials of Experimental Physiology.
Burridge : Alcohol and Anæsthesia.

Books of Reference :

Burridge : Excitability, a Cardiac Study.
Burridge : A New Physiology of Sensation.
Burridge : A New Physiological Psychology.
Wright : Applied Physiology.

The First Examination for the Degrees of M. B., B. S.

ADMISSION TO THE EXAMINATION.

Candidates before presenting themselves for the First Examination shall produce certificates of :—

(A) Having attended the following courses to the satisfaction of the Head of the College—

(*i*) In Human Anatomy and Embryology :—

(*a*) A course of lectures and demonstrations on Human Anatomy including Embryology, with special reference to their application to Medicine and Surgery, extending over two years.

(*b*) A course of dissections extending over two years. The candidates must have dissected the whole body to the satisfaction of their teachers.

(*ii*) Human Physiology —

(*a*) A course of lectures and demonstrations on Physiology, including Bio-Chemistry and Bio-Physics, extending over two years.

(*b*) A practical course in Histology, Experimental Physiology, Bio-Chemistry and Bio-Physics, extending over two years.

(*iii*) Normal Psychology —

A course of instruction in Elementary Normal Psychology.

(*iv*) The normal reactions of the body to injury and infection as an introduction to General Pathology and Bacteriology.*

(*v*) An introduction to Pharmacology.

(*vi*) Elements of the methods of clinical examination including the use of the common instruments and the examination of body fluids with demonstrations on both normal and abnormal living subjects.

*The amount of time allotted to the study of these subjects shall not exceed three months.

N. B.—Courses in iii, iv, v and vi above shall be attended in the second academic year.

(B) Having passed a test in iv, v and vi above, conducted by the College.

COURSES OF STUDY

(For 1943.)

The teaching of Anatomy and Physiology should include as a regular part of the courses, the demonstration on the living human body of structure and functions, including the information to be obtained from Radiology.

Anatomy.

1. Human Anatomy and Embryology with special reference to their application in Medicine and Surgery.

2. Dissection of the whole body at least once.

Books recommended : × × × × × × × × ×

Physiology.

1. The Physiology of the Blood, of Circulation, Respiration, Secretion and Excretion, Digestion and Absorption, Exchange of Material and Nutrition, Production and Discharge of Heat and the Maintenance of Normal Temperature in the Body.

2. The influence of the Nervous System on each of the above-named functions.

3. The elementary Physiology of Muscle and Nerve.

4. The Physiological Anatomy of the Brain and Spinal Cord and the localisation of function in these organs.

5. The Physiology of common and special Sensation and the Physiological Anatomy of the Sense Organs.

6. The Physiology of the Larynx : elementary facts relating to Voice and Speech.

7. The Physiology of the Ductless Glands.

8. The Physiological properties of Adrenaline, Atropine, Curare, Histamine, Nicotine, Pilocarpine, Strychnine, Ergotoxine and Acetyl-Choline.

9. Bio-Chemistry and Bio-Physics :

(1) Fats and Fatty acids.

Physical properties of fats, preparation of fatty acids from a fat, saponification of fats, determination of molecular weight of a fatty acid by titration, Determination of unsaponified matter. (Demonstration).

(2) Proteins.

Their definition, classification, general reactions, colour reactions. Heat coagulation of Albumins and globulins. The Chemistry of egg white, Metaproteins, Albumins and Peptones. Glucoproteins; Reactions of certain Albuminoids, *e. g.*, Gelatine and Keratin.

(3) Nucleoprotein, Nuclein and Nucleinic acid (Demonstrations.)

(4) The preparation and properties of Amino-acids (Demonstrations)

(5) Carbohydrates.

The Mono-saccharides, Di-saccharides, Poly-saccharides, Quantitative estimation of carbohydrates. Optical activity and the asymmetric Carbon Atom. (Demonstration).

(6) The Chemistry of some foods :—
Milk, Flour, Bread and Meat (Muscle).

(7) The Composition of the digestive juices :—

(*a*) Saliva.

(*b*) Gastric Juice.

The Actions of the following enzymes :—

Ptyalin, Pepsin, Rennin, Lipase, Trypsin (Demonstration), Amylopsin (Demonstration), Schardinger's enzyme in milk (Demonstration), Perosudase and Catalase (Demonstration). Autolysie (Demonstration).

(8) The coagulation of blood (Demonstration).

(9) The red blood corpuscles and the blood Pigments :—

The laking of blood. Haemoglobin and its derivatives. Spectroscopy of blood pigments.

(10) The constituents of Bile.

(11) The Urine and its constituents.

The average composition. Physical Chemistry of Urine. The pigments of Urine. The Inorganic constituents. Urea, Uric Acid, Purin. Bases, other than Uric acid. Creatinine and Creatine Ammonia.

Hyppuric Acid.

Certain constituents of abnormal urine, *e. g.*, Albumin and Globulin. Albumoses. Bence-jones's Protein. Blood pigments, Bile, Glucose, Pentose, Lactose, Acetone bodies, Glyduronic acid. Urinary sediments.

(12) Quantitative analysis of urine.

Total Nitrogen, Ammonia, Ammonia and Amino-acids, Urea, Creatinine and Creatine (Demonstration), Uric Acid, Glucose, Acetone Bodies (Demonstration). Chlorides, Phosphates, Sulphites (Demonstration), Albumin, Diastase.

(13) The analysis of blood.
Glucose, Urea, Cholesterol. Calcium and blood gases (Demonstration).

(14) Detection of substances of Physiological interest :—

(*a*) Fluids.

(*b*) Solids.

II—Bio-Physics (Theoretical).

The Gas Laws :—Boyle's Law. Gay Lussac's Law, Normal temperature and pressure. Avogadro's Theorem.

The General Gas Equation. Diffusion of gases and the Kinetic Theory. Deviation from Boyle's Law.

The Laws of Solution :—Water as a solvent—Solubility of gases. Henry's Law. Solubility of gases in aqueous solutions. Solubility of liquids. Solubility of solids. Electrolytic and non-electrolytic solutions.

Surface Tension :—Determination of surface tension—formation of emulsions. Refersal of emulsions. Surface tension of aqueous solutions. Practical applications. Gibbs Thomson Theorem.

Viscosity :—Its measurement. Viscosity of the blood.

Diffusion and Osmotic Pressure :—Measurement of Osmotic Pressure. Mode of action of semi-permeable membranes. Indirect measurement of Osmotic Pressure. Osmotic Pressure in the living organism.

The behaviour of electrolytes in solution :—the Theory of electrolytic dissociation. Theory of ionisation and electrolysis. Conductivity of solutions. The mobilities of ions. Bio-Chemical action of ions.

The Law of Mass Action :—Its applications. Balanced and reversible reactions. Hydrion :—Determination of the concentration of Hydrion :—(1) Electrometic method : (2) Indication method—Buffer solutions—Bacteriological applications.

The Colloidal State :—Crystalloids and Colloids—Suspensoids and emulsoid—The Ultra-microscope—Brownian movement—Formation of gels—Imbibition. Adsorption of a solid from a solution—Adsorption saturation. Some examples of adsorption—Electrostatic adsorption—Some biological applications. The permeability of the Cell Membrane :—

Changes in the permeability.
Nature of the Cell Membrane.

The Compound Miscroscope and Polarimetry.

Electricity and Magnetism :—Cells—Galvanism and Faradism—Constructions and uses of string galvanometer

and capillary electrometer—Du Bois Raymond's induction coil—Rheocord—Pohl's Commutator—Thermo-Electricity.

III. Bio-Physics (Demonstrations).

Experiments illustrating the important practical applications of the following phenomena to physiological processes :—

Filtration, Diffusion, surface tension, Viscosity, Osmosis, Behaviour of electrolytes in solution, Law of mass action, Hion Concentration, Enzyme action and Catalysis, Colloidal state, Adsorption, Permeability of Cell membrane, Polarimetry and Thermo-electricity.

N. B.—Each written paper shall be divided into two equal sections. One of the four sections shall be devoted to Bio-Chemistry and Bio-Physics, and in one of the remaining three sections, one of the questions shall pertain to Elementary Normal Psychology.

The Second Examination for the Degrees of M. B., B. S.

ADMISSION.

Before admission to the Second Examination, candidates shall present certificates of having completely attended the following courses to the satisfaction of the Head of the College :—

In Pharmacology, including Elementary Pharmacological Chemistry and Materia Medica.

A course of lectures and demonstrations, extending over one year.

In Practical Pharmacy—

A course of demonstrations and practical work extending over one year.

(For 1942, 1943, and 1944.)

Pharmacology, including Pharmacy, Materia Medica, and Pharmacological Therapeutics.

(*a*) A study of Materia Medica including—

(*i*) The Physical and Chemical Properties of the active principles of plants.

(*ii*) Definitions of the Pharmaceutical processes and pharmaceutical preparations.

(*iii*) Posology.

(*iv*) The course, character, and preparations of drugs, pharmacopœal and indigenous.

(*b*) A study of the pharmacological actions of drugs (pharmacopœal and indigenous) including the following :—

(*i*) Chemical and physical basis of Pharmacology.

(*ii*) Methods of administering drugs.

(*iii*) Conditions influencing drug action—Idiosyncracy, anaphylaxis, tolerance and cumulative action.

(*iv*) Conditions influencing absorption and excretion of drugs.

(*v*) Pharmacological therapeutics.

(*c*) A course of practical instruction in the following, for at least one term each :-

(*i*) Pharmacy, including principles of dispensing, use of balance : incompatibilities and compounding of mixtures, emulsions, liniments, plasters, ointments, pills, powders, cachets, capsules, and suppositories.

(*ii*) Experimental Pharmacology, illustrating the action of drugs on blood vessels ; heart, intestines, uterus, central nervous system ; secretions, protozoa and ciliated epithelium.

The course to extend over one year and shall consist of at least :—

(1) 50 lectures in Pharmacology and Pharmacological Therapeutics.

(2) 15 Demonstrations in experimental Pharmacology.

(3) Thirty demonstrations in Materia Medica and Pharmacy.

The Final Examination for the Degrees of M. B., B. S.

ADMISSION.

Before admission to the Third or Final M. B., B. S. Examination, candidates shall present certificates of having satisfactorily attended the following courses to the satisfaction of the Head of the College :—

I. Medicine.

(*a*) A course of lectures and clinical demonstrations in Medicine, including Diseases of Infancy and Childhood, extending over two years.

NOTE.—The course of instruction in Medicine shall include the practice of Clinical Pathology and laboratory methods and the application of Physiology and Anatomy to the investigation of diseases.

(*b*) A medical clinical clerkship for a period of nine months of which six months must be sent in the hospital wards and three months in the out-patient department.

(*c*) A clinical clerkship for not less than one month in a children's ward or hospital, or in a children's out-patient department.

NOTE.—During the period of medical ward clerking, candidates must have been in residence in hospital or close by for a continuous period of three months as intern clerks.

(*d*) Instruction in Therapeutics and Prescribing, including (i) pharmacological therapeutics, (ii) the methods of treatment by vaccines and sera, (iii) physiotheraphy, (iv) Dietetics, and (v) the principles of nursing.

(*e*) Every candidate shall also present evidence of having received instruction in the following subjects :—

(*i*) Fevers. (This course must be taken at a recognised Infectious Diseases Hospital for a period of three months).

(*ii*) Tuberculosis.

(*iii*) Dermatology.

(iv) Practical instruction in Vaccination from one of the authorised Vaccinators.

NOTE.—Throughout the whole period of instruction in Medicine, importance of the preventive aspects of the subject shall be emphasised.

N. B.—The appointments mentioned in sub-clauses *(b)* and *(c)* under the head *(i)* Medicine above, and *(b)* and *(d)* under the head *(ii)* Surgery later, may be concurrent.

II. Surgery.

(a) A course of lectures and clinical demonstrations in Surgery, including diseases of infancy and childhood, extending over two years.

NOTE.—The course of instruction in Surgery shall include instruction in Surgical Pathology and the application of Physiology and Anatomy to the investigation of diseases.

(b) A Surgical dressership for a period of nine months of which six months must be spent in the hospital wards and three months in the out-patient department.

NOTE.—During the period of surgical ward dressing, candidates must have been in residence in hospital or close by for a continuous period of three months as intern clerks.

(c) A course of practical instruction in Operative Surgery, including operations on the cadaver to be performed by the students themselves, extending over a period of one term.

(d) Practical instruction in minor surgery on the living.

(e) Practical instruction in Surgical methods, including Physiotherapy.

(f) Every candidate shall also present evidence of having received adequate instruction in the following subjects :—

(*i*) Administration of Anaesthetics. (Candidates

shall be required to produce a certificate of having administered Anaesthetics on, at least, ten occasions.)

(*ii*) Dental Surgery.

(*iii*) Radiology and Electro-therapeutics in their application to Surgery.

(*iv*) Venereal Diseases.

(*v*) Diseases of Ear, Nose and Throat including the use of the Otoscope, Laryngoscope and Thinoscope.

(*vi*) Orthopaedics.

NOTE.—Throughout the whole period of instruction in Surgery, importance of the preventive aspects of the subject shall be emphasised.

III. Midwifery and Diseases of Women.

(*a*) A course of lectures and clinical demonstrations, extending over one year in Midwifery, Gynaecology and Hygiene of the New-Born. The course of instruction in Midwifery shall include Applied Anatomy and Physiology of Pregnancy and labour.

(*b*) An appointment for six months as a clinical Clerk in Maternity and Gynaecological departments, during which period candidates must have conducted twenty labour cases in a recognised Maternity Hospital or in the lying-in wards of a General Hospital under the supervision of a qualified member of the Medical staff; they shall have also attended during this period Gynaecological out-patients and antenatal clinics at recognised institutions.

NOTE 1.—During the period of clinical clerkship, candidates must have been in residence in hospital or close by for a continuous period of three months as intern clerks.

NOTE 2.—A certificate showing the number of cases of labour conducted by the candidates in the Maternity hospital should be signed by a

responsible Medical Officer on the staff of the Hospital, and should state :—

(*i*) That the candidates have personally conducted all the certified cases during the course of labour, and have made the necessary abdominal and other examinations under the supervision of the certifying officer.

(*ii*) That satisfactorily written histories of the cases attended by the candidates were presented to the supervising officer and countersigned by him.

(*iii*) That the candidates have attended the antenatal out-patient department and have written out at least 20 cases in an antenatal case book certified by a responsible Medical Officer on the staff of the hospital.

IV. Ophthalmology.

(*a*) A course of 25 lectures and 30 demonstrations on refraction and use of ophthalmoscope.

(*b*) An attendance for three months in the Ophthalmic. Out-Patient department and wads of a recognised hospital

V. Pathology.

(*a*) A course of lectures, demonstrations and practical work in Pathology, extending over two years.

(*b*) A course of lectures, demonstrations and practical work in Bacteriology and Elementary Parasitology, extending over two years.

(*c*) A course of instruction in Chemical Pathology and in Clinical Pathology and Bacteriology.

(*d*) A certificate of having performed at least ten autopsies as a *post mortem* clerk.

The candidates will be required to submit to the examiners full records of ten autopsies which they have attended and which have been certified by the teachers in that subject.

VI. Forensic Medicine.

Medical Jurisprudence, including Insanity and Toxicology.

Medical Jurisprudence:

(*a*) A course of 36 lectures in Forensic Medicine and Toxicology, including 8 demonstrations.

(*b*) The candidates will be required to produce a certificate of having attended six *medico-legal* autopsies.

VII. Preventive Medicine.

Hygiene:

A course of 36 lectures in preventive medicine and 8 demonstrations on Hygiene, Food and dietaries.

COURSES OF STUDY.

(For 1944.)

Medicine.

Medicine, including Applied Anatomy and Physiology, Clinical Pathology and Therapeutics, comprising:—

1. A course of not less than 75 lectures in the principles and practice of Medicine and a series of not less than 40 clinical lectures.

2. The Medical practice in a recoginised Hospital during three years, with clinical instruct on and experience as a Medical Clinical Clerk for not less than six months in the Hospital wards, including Clinical Pathological investigations in the student's own cases in the Hospital Clinical Room, and three months in the Out-Patients Department.

3. A course of not less than 20 demonstrations of Clinical Methods, Applied Medical Anatomy and Physiology, the recognition and interpretation of physical signs and the use of instruments of observation.

4. Instruction in Therapeutics and Prescribing, including Pharmacological Therapeutics, Electro-actino and

Radio-therapeutiar, Mechano-Therapeutics and Vaccine and Serum therapy.

5. A course of instruction in :—

(*a*) Diseases of Children.

(*b*) Acute Infectious diseases. (Fevers)—A minimum of 15 attendances at the Hospital for Infectious Diseases.

(*c*) Tuberculosis—Attendance for six weeks (fifteen attendances) in the Tuberculosis wards and the Tuberculosis Out-Patient Clinique.

9 lectures and 9 Clinical Demonstrations in a Mental Hospital.

(*d*) Mental Diseases.

(*e*) Diseases of the Skin, including Leprosy :—

Attendance for six weeks (fifteen attendances) in the Out-Patient Clinique for Skin Diseases.

Books recommended :

Surgery.

Surgery, including Applied Anatomy and Physiology and Clinical Pathology, comprising :—

1. A course of not less than 100 lectures on the principles and practice of Surgery and a series of not less than 40 clinical lectures.

2. The Surgical practice in a recognised Hospital during three years with clinical instructions and experience as a Surgical dresser for nine months of which at least six months must have been spent in the Hospital wards, including Clinical Pathological investigations on the student's own cases in the Hospital Clinical Room.

3. A course of not less than 20 demonstrations on Surgical methods including Mechano-therapeutics.

4. A course of instruction in the administration of Anaesthetics, including four lectures. The candidate must be certified to have administered Anaethetics on at least ten occasions, under the guidance of the Anaesthetist.

5. A course of instruction in Surgical Anatomy and Physiology and in Operative Surgery with operations on the cadaver. The course will cover 30 attendances and may commence in the first term of the fifth year.

6. A course of instruction in—

(*a*) Radiology and Electro-therapeutics. A course of eight lectures and attendance in the Radiology Section for six weeks (fifteen attendances).

(*b*) Diseases of the Ear, Nose and Throat, including the practical use of the Otoscope, Laryngoscope, and Rhinoscope. A course of 10 lectures and attendances for six weeks (fifteen attendances) in the Ear, Nose and Throat Clinic.

(*c*) Venereal Diseases. A course of ten lectures and attendance for six weeks (fifteen attendances) in the Out-Patient Clinique for Venereal Diseases.

(*d*) Dental Surgery. A course of eight lectures and attendance for one month (twelve attendances) in the Dental Clinique.

7. Courses of instruction in—

(*a*) Applied Surgical Anatomy, Physiology and Clinical Pathology.

(*b*) Practical Surgery.

(*c*) Orthopaedics.

(*d*) Surgical Diseases of Children.

Books recommended :

Obstetrics and Gynaecology.

Obsterics and Gynaecology, including Applied Anatomy, Physiolgy, Clincal Pathology and Infant Hygiene, comprising :—

1. A course of Systematic lectures on the principles and practice of Midwifery and Gynaecology.

2. Attendance as a Clinical Clerk for Clinical instruction and experience in a recognised Maternity Hospital (or in the Maternity Wards of a recognised General Hospital) and on the In-Patient (and *Out Patient) Gynaecological practice thereof for a period of three months each, *i. e.*, a total period of six months out of which three months will be devoted as residential clerkship.

3. During this clerking, the student shall receive practical instruction in the wards and the Out-patient Department in the principles of

(*a*) Ante-natal care.

(*b*) Management of the puerperium.

(*c*) Care of the new-born infant.

4. Of this period of Clinical instruction not less than one month should be spent as a resident pupil, devoted exclusively to instruction in Midwifery and in the Hygiene of Infants. The student should during this month attend at least 20 cases of labour under adequate supervision. Should the number of cases attended during this month be less than 20, the remainder must be attended as soon as possible under the same condition.

5. The certificate granted by the Lecturer/Professor shall state:—

(1) The number of cases the student has personally attended, making the necessary abdominal and other examinations under the supervision of the certifying officer, whose position shall be stated.

(2) That ten at least of the twenty cases were delivered by the student in the labour wards.

(3) That satisfactory written histories of the cases attended, including, when possible, ante-natal and post-natal observations, were presented by the student and initialled by the supervising

*Note The Professor will consult with the Principal after each year as to whether the time has yet come to allow students to the Out-Patient Practice of the Maternity Hospital without detriment to the complete success of that Hospital

officer. Candidates may be required to produce these History-Books before examiners as evidence of their diligent work.

6. A course of not less than 20 demonstrations on practical Obstetrical and Gynaecological Instruments and Appliances.

7. A course of lectures in the Diseases of Infants.

8. Instruction in Contraceptive Methods.

Books recommended:

Ophthalmology.

Ophthalmology, including Applied Anatomy, Physiology and Clinical Pathology.

1. A course of 25 lectures on diseases of the eye.

2. Three months' Clinical Work as Ophthalmic Clerk, including Clinical Pathological investigations on the student's own cases in the Hospital Clinical Room.

3. A course of 20 demonstrations in Refractions and use of Ophthalmoscope.

Pathology and Bacteriology.

A course of instruction in Pathology (General and special). Bacteriology, Parasitology, with practical classes in Morbid Histology, Bacteriology, Parasitology, Medical Entomology, and Chemical Pathology.

Each student should be required to have received practical iustruction in the conduct of autopsies and to have acted as a post-mortem clerk in at least ten cases, so far as may be practicable.

The course to extend through two academic years, being the third and fourth year of student's curriculum.

Books recommended: × × × × × × × × ×

Courses in Clinical Pathology and in Elementary Bacteriology and Parasitology should be commenced as soon

as possible after the student has entered upon his clinical studies and completed before the student is allotted beds.

6. Medical Jurisprudence, including Toxicology and Mental diseases.

Medical Jurisprudence.

A course of lectures on Medical Jurisprudence comprising chiefly the following subjects :—

Legal Procedure in Criminal Courts. Medical evidence. Identity of the living and the dead. Post-mortem examination. Exhumation. Examination of blood. Seminal and other stains. Death in its medico-legal aspect. Violent asphyxial deaths from hanging, strangulation, suffocation and drowning. Death from extremes of temperature, burns, scalds, electricity and lightning. Mechanical injuries.

Subjects involving sexual relation and offences.

Toxicology.

Symptoms, treatment, post-mortem appearance and detection of poisons commonly used in India.

Medical Ethics and duties that devolve upon Practitioners in their relation to the State.

Attendance at not less than 6 medico-legal post-mortem examinations.

One lecture to be devoted to professional privilege responsibilities, obligstions, together with the provisions of the United Provinces Medical Registration Act No. III of 1917 and the British Medical Act.

Mental Diseases.

Books recommended : × × × × × × × × ×

Normal Psychology, Sensation, Perception, Idea, Attention, Affection, Emotion, Conation, Instinct, Habit, Reflex Action.

Association of Ideas, Memory, Judgment and Reasoning, Belief, Reaction, Time.

Causation of Insanity – Classification, general symptomatology.

Illusions—Hallucinations, Delusions—Abnormal Habits —Impulsive Acts—Fatigue—Jealousy.

Mania, Melancholia, Manic—Depressive Insanity, Paronia, Stupor, Dementia Praecox, Epochal Insanities. Puerperal, Climacteric, Senile Intoxication—Psychosis—Alcoholism—Morphinism—Cocainism—General Paralysis of the insane—Acute Hallucinatory Psychosis—Epilepsy—Psychosthenia—Idiocy and Imbecility.

Feigned Insanity.

Relationship of Insanity with Law.

Insanity in its medico-legal aspect.

Books recommended: × × × × × × × × ×

Hygiene and Public Health.

1. One course of 36 lectures and 8 demonstrations on Hygiene. Personal hygiene. Food and dietaries. The construction of the dwelling-houses with reference to (*a*) the proper access of sunlight and air, (*b*) methods of natural and artificial ventilation, warming and water-supply, (*c*) the disposal of refuse and excretal matters. The effect on health of over-crowding, vitiating air, occupation and offensive trades.

Effects on health of impure water, polluted soil and unsound or infected food.

The inspection of meat, grain, and other articles of food.

Climatology and Meteorology.

The aetiology and prevention of endemic and epidemic diseases with special reference to Indian conditions. The methodical investigation of cases of such diseases with reference to their causation. The relation to human diseases of the common diseases and parasites of other forms of life, animal or vegetable.

Control of tuberculosis, of leprosy.

The general principles and methods of vaccination, preventive inoculation, isolation and disinfection.

Elements of vital statistics, correct certification of causes of death.

Causes and prevention of infant mortality, with special reference to welfare work in this and other countries.

The principles of School Hygiene and medical inspection of School Children.

Village sanitation.

Sanitary arrangements at fairs.

The obligation of medical practitioners as required by law relating to public health.

2. Demonstration, each of two hours, 4 may be out-door demonstrations and 4 may be given in measure.

The out-door demonstrations may include :—

(1) Filtration of water (visit to Agra Water Works).

(2) Sewerage system.

(3) Maternity and Child Welfare (visit to a Child Welfare Centre).

(4) School Hygiene and medical inspection of school children (visit to school) or alternately such other demonstrations as may be conveniently arranged.

3. A course in the Theory and Practice of Anti-Small-Pox Vaccination, including two attendances of two hours each.

AGRA UNIVERSITY

NOTICE

"THE STATUTES AND REGULATIONS" relating to *all* the examinations of 1942 are published separately and can be obtained from the Printer-Stockist **Mr. Lakshmi Narain Agarwal, Educational Bookseller, Hospital Road, Agra** (and *not* from the University Office as heretofore), on payment of As. 4 on account of price and As. 4-6 p. on account of postage and registration charges. These Statutes and Regulations supersede *all* the Statutes and Regulations published before May, 1941. Copies can also be obtained from the same firm by V. P. P.

The Statutes and Regulations for all the examinations of 1943 will be published in May, 1942.

SENATE HOUSE,
AGRA:
May 15, 1941.

SHYAM SUNDAR SHARMA, M. A.,
Registrar.

AGRA UNIVERSITY

NOTICE

COPIES of the "Text-books and Syllabuses" prescribed for the examinations to be held in 1942 and 1943 can be obtained from the Printer-Stockist **Mr. Lakshmi Narain Agarwal, Educational Bookseller, Hospital Road, Agra,** (and *not* from the University Office as heretofore), on payment of As. 6-6 p. on account of price, and As. 5 on account of postage and registration charges. Copies can also be obtained from the same firm by V. P P.

SENATE HOUSE,
AGRA:
May 15, 1941.

SHYAM SUNDAR SHARMA, M. A.,
Registrar.